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## **Workshop Manual**

**Audi A6 2011 ➤**

**Audi A6 China 2012 ➤**

**Audi A7 Sportback 2011 ➤**

**Brake system**

Edition 03.2019

## List of Workshop Manual Repair Groups

### Repair Group

00 - Technical data

45 - Anti-lock brake system

46 - Brakes - mechanism

47 - Brakes - hydraulics



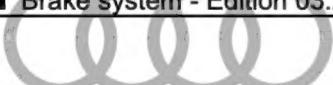
Technical information should always be available to the foremen and mechanics, because their careful and constant adherence to the instructions is essential to ensure vehicle road-worthiness and safety. In addition, the normal basic safety precautions for working on motor vehicles must, as a matter of course, be observed.

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## 00 – Technical data

### 1 Identification

(ARL006363; Edition 03.2019)

⇒ [“4.1 Technical data for brakes”, page 6](#)

#### 1.1 PR number and type of brake system

The type of brake system installed in the vehicle is indicated by the corresponding PR number on the vehicle data sticker.

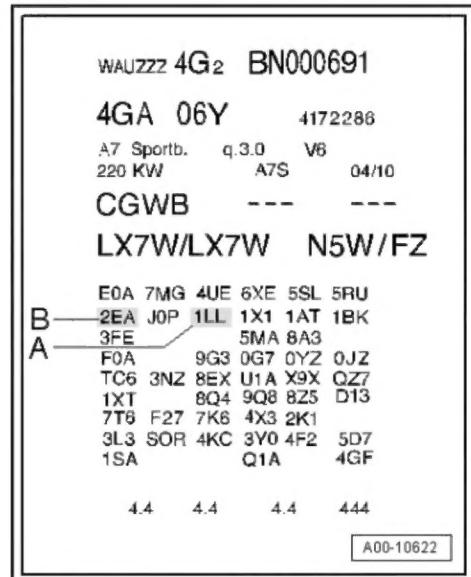
Example of a vehicle data sticker:

A - Front brakes 1LL

B - Rear brakes 2EA

◆ For correct version refer to ⇒ Electronic parts catalogue “ET-KA”

◆ The tables ⇒ [page 6](#) explain the PR numbers. These are important to obtain the correct combination of brake calipers/brake discs and brake pads.



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## 2 Safety precautions

- ⇒ [“2.1 Safety precautions when working on high-voltage vehicles”, page 2](#)
- ⇒ [“2.2 Safety precautions when working on vehicles with start/stop system”, page 3](#)
- ⇒ [“2.3 Safety precautions when using testers and measuring instruments during a road test”, page 4](#)

### 2.1 Safety precautions when working on high-voltage vehicles



#### WARNING

*Safety hazard: the engine can start unexpectedly.*

*Before carrying out general work on a vehicle with high-voltage electrical system, switch off the ignition and remove the ignition key from the vehicle.*



#### DANGER!

*When working on a vehicle with the ignition switched on or while the drive system is active, the engine can start unexpectedly and exhaust fumes can cause a health hazard in closed rooms. Moving parts can trap or draw in parts of the body and/or clothing (safety hazard).*

*Before switching on the ignition, perform the following steps:*

- ◆ *Move selector lever to position P*
- ◆ *Activate parking brake*
- ◆ *Switch off ignition*
- ◆ *Open bonnet*
- ◆ *Connect battery charger (e.g. battery charger - VAS 5095A-) to jump-start connections of 12 V electrical system*
- ◆ *Switch on ignition*



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## DANGER!

*Risk of fatal injury if high-voltage components are damaged.*

*Observe the following when working in the vicinity of high-voltage components or wiring:*

- ◆ *It is not permitted to use cutting or forming tools, other sharp-edged tools or heat sources such as welding, brazing, soldering, hot air or thermal bonding equipment.*
- ◆ *Before starting work, visually inspect the high-voltage components in the areas involved.*
- ◆ *Before working in the engine compartment, visually inspect the power and control electronics for electric drive - JX1-, electric drive motor - V141-, air conditioner compressor - V470- and high-voltage wiring.*
- ◆ *Before working on the vehicle underbody, visually inspect the high-voltage wiring and covers.*
- ◆ *Before working on the rear section of the vehicle, visually inspect the high-voltage wiring and the electronics box with the maintenance connector for high-voltage system - TW- .*
- ◆ *Visually inspect all potential equalisation lines.*

*Check the following when making the visual inspection:*

- ◆ *There must be no external damage on any component.*
- ◆ *The insulation of the high-voltage wiring and potential equalisation lines must not be damaged.*
- ◆ *There must be no unusual deformation of the high-voltage wiring.*
- ◆ *All high-voltage components must be identified by a red warning sticker.*

## 2.2 Safety precautions when working on vehicles with start/stop system

When performing repairs on vehicles with start/stop system, note the following:



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- ◆ *On vehicles with activated start/stop system (indicated by a message in the instrument cluster), the engine may start automatically if it needs to.*
- ◆ *Therefore it is important to ensure that the start/stop system is deactivated when performing repairs (switch off ignition, if required switch on ignition again).*

## 2.3 Safety precautions when using testers and measuring instruments during a road test

Please note the following if test and measuring equipment has to be used during a road test:

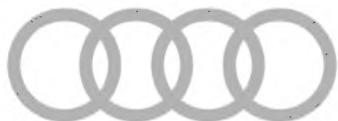


### WARNING

*Accidents can be caused if the driver is distracted by test equipment or if test equipment is not secured.*

*There is a risk of injury if the passenger's airbag is triggered during an accident.*

- *The operation of test and measuring equipment during a road test distracts the driver's attention.*
- *There is an increased risk of injury if test and measuring equipment is not secured.*
- ◆ *All test equipment must be secured on the rear seat with a belt and operated by a 2nd person from this location.*



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### 3 Repair notes

⇒ "3.1 Rules for cleanliness", page 5

⇒ "3.2 General repair instructions", page 5

⇒ "3.3 Contact corrosion", page 5

#### 3.1 Rules for cleanliness

- ◆ Absolute cleanliness is required when working on the anti-lock brake system; avoid any products that contain mineral oil, such as oil, grease, etc.
- ◆ Thoroughly clean all connections and the adjacent areas before loosening, but do not use aggressive cleaning agents such as brake cleaner, petrol, thinners or similar.
- ◆ After removal, place parts on a clean surface and cover them.
- ◆ If repairs cannot be completed immediately, carefully cover or seal open components (use sealing plugs from assembly parts set - 5Q0 698 311- ).
- ◆ Only use lint-free cloths.
- ◆ Only remove replacement parts from packaging immediately prior to installation.
- ◆ Only use genuine spare parts from original packaging.
- ◆ When the system is open, do not work with compressed air and do not move the vehicle.
- ◆ Ensure that no brake fluid enters electrical connectors.

#### 3.2 General repair instructions

- ◆ When performing repair work on brakes, hairline cracks are often found on the friction surface of the brake discs. Hairline cracks up to a length of 10 mm do not present a technical problem and do not justify a renewal of brake discs.
- ◆ Brake discs and pads with cracks going all the way across the friction surface must be renewed.

#### 3.3 Contact corrosion

Contact corrosion can occur if unsuitable fasteners are used (e.g. bolts, nuts, washers, etc.).

For this reason, only fasteners with a special surface coating are fitted.

Additionally, all rubber and plastic parts and all adhesives are made of non-conductive materials.

Always install new parts as listed in the ⇒ Electronic parts catalogue "ETKA" if you are unsure of the suitability of parts.

Please note:

- ◆ We recommend using only genuine replacement parts; these have been tested and are compatible with aluminium.
- ◆ We recommend using Audi Genuine Accessories.
- ◆ Damage caused by contact corrosion is not covered by the warranty.

## 4 Technical data

⇒ “4.1 Technical data for brakes”, page 6

### 4.1 Technical data for brakes

Front brakes, steel version			
Brake		FBC-60 16" <sup>1)</sup>	FBC-60 17" <sup>1)</sup>
PR No.		LA	1LJ
Brake disc, ventilated	Ø mm	320	345
Brake disc, thickness (new)	mm	30	30
Brake disc, wear limit	mm	28	28
Brake pads, wear limit	mm	⇒ Maintenance ; Booklet 411	



#### Note

- ◆ Maximum lateral run-out of steel brake disc: 0.06 mm
- ◆ Perform measurement with brake disc installed.
- ◆ Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.
- ◆ Remove any dirt and rust from brake disc.
- ◆ Perform measurement 10 mm from outer edge of brake disc.

1) For correct version refer to ⇒ Electronic parts catalogue "ETKA"

Front brakes		
Type		Brembo (17" brakes)
PR No.		1LP
Brake disc, ventilated	Ø mm	345
Brake disc, thickness	mm	30
Brake disc, wear limit	mm	28



#### Note

- ◆ Maximum lateral run-out of steel brake disc: 0.06 mm
- ◆ Perform measurement with brake disc installed.
- ◆ Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.
- ◆ Remove any dirt and rust from brake disc.
- ◆ Perform measurement 10 mm from outer edge of brake disc.

Front brakes, steel version				
Brake		2 FNR-AL 42 17" <sup>2)</sup>	Brembo 19" <sup>2)</sup>	Brembo wave de- sign 19" <sup>2)</sup>
PR No.		1LL/1LF/1LG/1ZK/ FM0	1LU/1LV	1LM/1LX
Brake disc, ventilated	Ø mm	356	400	390
Brake disc, thickness (new)	mm	34	38	36
Brake disc, wear limit	mm	32	36	34

Front brakes, steel version		
Brake pads, wear limit	mm	⇒ Maintenance ; Booklet 411

**Note**

- ◆ Maximum lateral run-out of steel brake disc: 0.06 mm
- ◆ Perform measurement with brake disc installed.
- ◆ Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.
- ◆ Remove any dirt and rust from brake disc.
- ◆ Perform measurement 10 mm from outer edge of brake disc.

2) For correct version refer to ⇒ Electronic parts catalogue "ETKA"

Front brakes, ceramic version				
Brake		Brembo 19" <sup>3)</sup>	Brembo 19" <sup>3)</sup>	
PR No.		1LW	1LN	
Brake disc, ventilated	Ø mm	400	420	
Brake disc, thickness (new)	mm	38	40	
Brake disc, wear limit	mm	Assessing degree of wear ⇒ page 14		
Brake pads, wear limit	mm	⇒ Maintenance ; Booklet 411		

3) For correct version refer to ⇒ Electronic parts catalogue "ETKA"

Rear brakes, steel version					
Brake					Wave design
PR No.		1KW <sup>4)</sup>	2EA/2EE/2EJ/ 1KD <sup>4)</sup>	1KY/1KZ <sup>4)</sup>	1KJ/1KQ <sup>4)</sup>
Brake disc, ventilated	Ø mm	300	330	356	356
Brake disc, thickness (new)	mm	12	22	22	22
Brake disc, wear limit	mm	10	20	20	20
Brake pads, wear limit	mm	⇒ Maintenance ; Booklet 411			

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- ◆ Maximum lateral run-out of steel brake disc: 0.06 mm
- ◆ Perform measurement with brake disc installed.
- ◆ Use dial gauge bracket VAS 6079/1 and dial gauge VAS 6079.
- ◆ Remove any dirt and rust from brake disc.
- ◆ Perform measurement 10 mm from outer edge of brake disc.

4) For correct version refer to ⇒ Electronic parts catalogue "ETKA"

Rear brakes, ceramic version		
PR No.		1KK/1KU <sup>5)</sup>

Rear brakes, ceramic version		
Brake disc, ventilated	Ø mm	370
Brake disc, thickness	mm	30
Brake disc, wear limit	mm	Assessing degree of wear ⇒ <a href="#">page 14</a>
Brake pads, wear limit	mm	⇒ Maintenance ; Booklet 411

5) For correct version refer to ⇒ Electronic parts catalogue "ETKA"



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## 5 Brake test

- ⇒ "5.1 General notes", page 9
- ⇒ "5.2 Testing vehicles with front-wheel drive", page 9
- ⇒ "5.3 Testing vehicles with four-wheel drive", page 9
- ⇒ "5.4 Testing parking brake", page 10
- ⇒ "5.5 Visible features of ceramic brake discs", page 10
- ⇒ "5.6 Superficial cracks in cooling channel lands", page 12
- ⇒ "5.7 Cracks in area of bolted connection on ceramic brake discs", page 12
- ⇒ "5.8 Edge fractures", page 13
- ⇒ "5.9 Chipping on ceramic brake discs", page 13
- ⇒ "5.10 Cracks extending into cooling channels", page 14
- ⇒ "5.11 Assessing degree of wear on ceramic brake discs", page 14
- ⇒ "5.12 Wear assessment with tester VAS 6813", page 22

### 5.1 General notes

- ◆ The wheels are driven by the brake test rollers.
- ◆ During the test the gearbox must be in neutral on manual gearboxes or in position N on automatic gearboxes.
- ◆ Follow the instructions provided by the manufacturer of the brake test equipment when performing the test.



Note

*Electronic brake control systems are inoperative when the ignition is switched off.*

### 5.2 Testing vehicles with front-wheel drive

- ◆ Perform brake test on a single-axle brake dynamometer.
- ◆ The test speed must not exceed 5 km/h. Otherwise the EDL control can activate the brakes if the rollers start at different points in time.
- ◆ All brake test equipment approved by Audi meets these requirements.

### 5.3 Testing vehicles with four-wheel drive

Testing on a single-axle brake dynamometer for four-wheel drive vehicles

- ◆ The rollers drive the wheels of one axle in opposite directions to avoid transmitting torque to the other axle.
- ◆ The test speed must not exceed 6 km/h. Otherwise the EDL control can activate the brakes if the rollers start at different points in time.
- ◆ All brake test equipment approved by Audi meets these requirements.

## 5.4 Testing parking brake

### Test sequence

- Drive rear wheels of vehicle onto test rollers and leave ignition switched on.



Note



*Do not switch off ignition.*

- "Test mode" is activated as soon as the speed of the rollers exceeds 3 km/h.
- The instrument cluster will then display a crossed-out yellow symbol for the electromechanical parking brake ⇒ Owner's Manual; Instruments and warning/indicator lamps .

The electromechanical parking brake will now function as follows:

- ◆ The brake is not applied abruptly; it is applied gradually each time the electromechanical parking brake button - E538- is actuated. The brake will be fully applied after operating the button 3 times.
- ◆ Pressing the electromechanical parking brake button - E538- releases the brake again.

Requirements for "test mode":

- Ignition on
- Front wheels, speed = 0 km/h
- Rear wheels, min. speed = 3 km/h, max. speed = 9 km/h



### WARNING

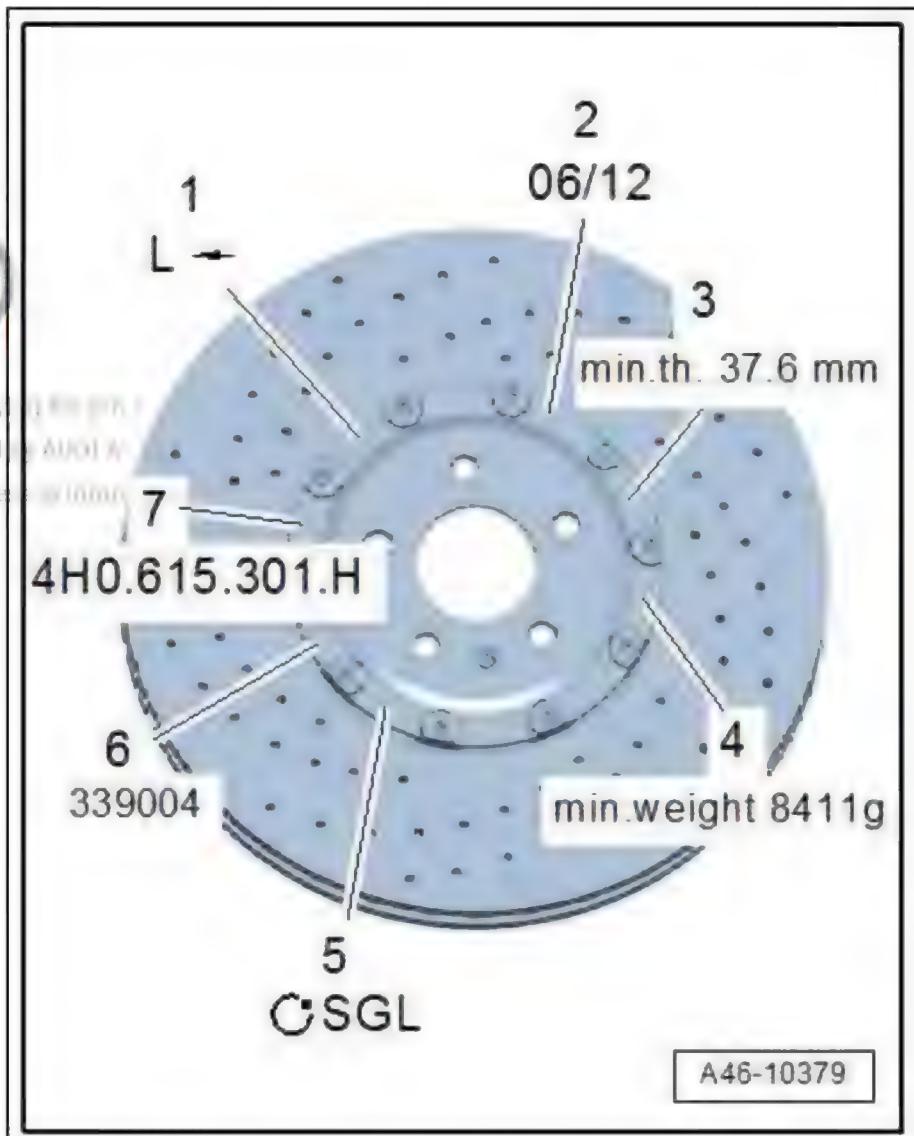
*When testing models with four-wheel drive you must use brake test rollers with synchronised wheel speeds.*

## 5.5 Visible features of ceramic brake discs

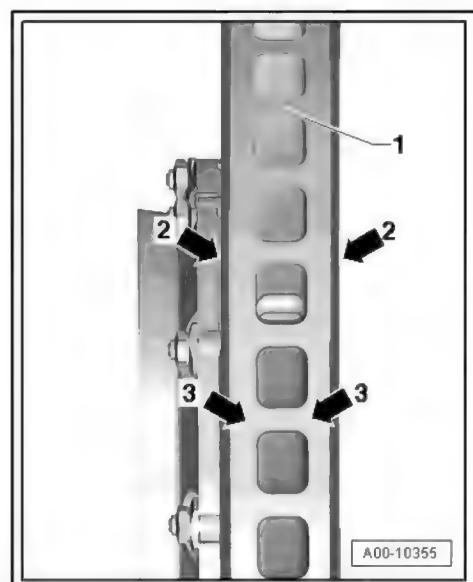
- ⇒ "[5.7 Cracks in area of bolted connection on ceramic brake discs](#)", page 12
- ⇒ "[5.8 Edge fractures](#)", page 13
- ⇒ "[5.9 Chipping on ceramic brake discs](#)", page 13
- ⇒ "[5.10 Cracks extending into cooling channels](#)", page 14
- ⇒ "[5.11 Assessing degree of wear on ceramic brake discs](#)", page 14

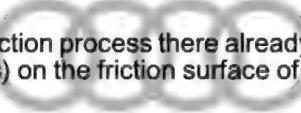
Designation of ceramic brake disc on brake disc hub

- 1 - Direction of rotation
- 2 - Production date of brake disc
  - Example
- 3 - Minimum thickness of brake disc
  - Example
  - Wear limit ⇒ [page 19](#)
- 4 - Minimum weight of brake disc with brake disc hub
  - Example
- 5 - Supplier
  - Example
  - with respect to the correct assembly
- 6 - Serial production number of brake disc
  - Example
- 7 - Audi part number
  - Example



- 1 - Cooling channel lands
- 2 - Friction layer
- 3 - Carrier material

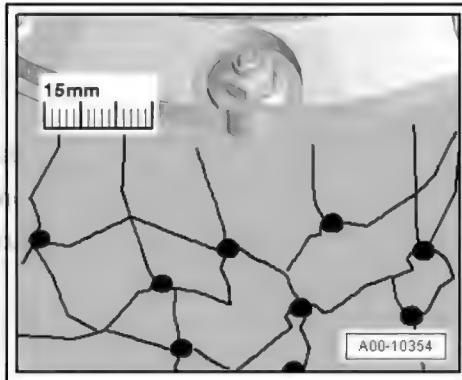


  
Due to the production process there already are relaxation cracks (varying degrees) on the friction surface of the brake disc when it is new.



Note

- ◆ *Relaxation cracks on a ceramic brake disc do not constitute a technical problem.*
- ◆ *The relaxation cracks may be clearly visible and vary in size.*
- Check area of bolted connection on friction ring and brake disc hub → [page 12](#).



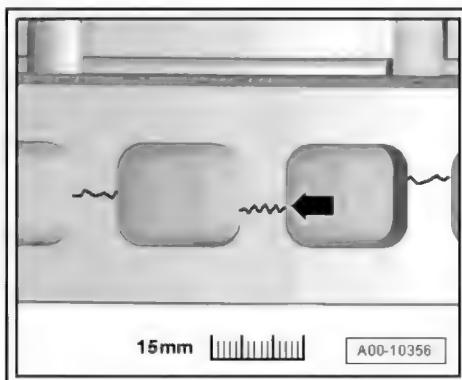
## 5.6 Superficial cracks in cooling channel lands

Superficial cracks -arrow- in the cooling channel lands are caused during manufacturing.



Note

*Superficial cracks in the cooling channel lands -arrow- do not constitute a technical problem on the ceramic brake discs.*



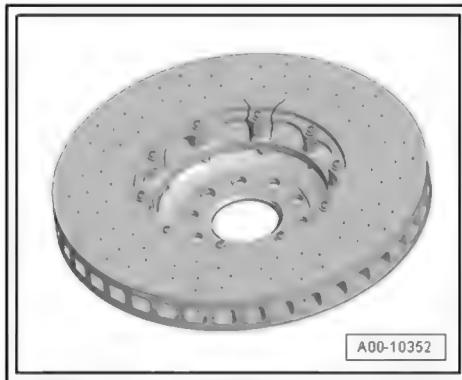
## 5.7 Cracks in area of bolted connection on ceramic brake discs



### WARNING

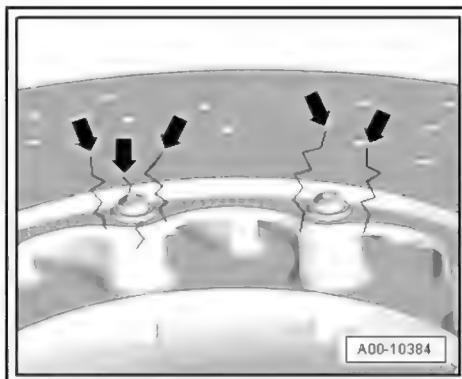
*Risk of accident due to slackened bolts*

- ◆ *The brake disc rotor and the brake disc hub are bolted together and must NOT be separated. DO NOT slacken the bolted connection on the brake disc hub.*



Renew the ceramic brake discs if the following types of damage have occurred:

- ◆ Radial cracks in the area of the bolted connection of the brake disc hub extending into the friction surface of the brake disc -arrows-

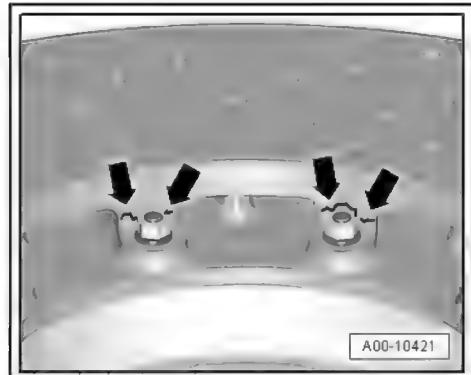
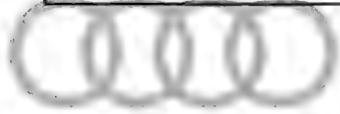


- ◆ Tangential cracks -arrows- in the bolted joint area



#### WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.



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## 5.8 Edge fractures

- Edge fractures -arrow- are caused by mechanical damage to the edges.

Permissible:

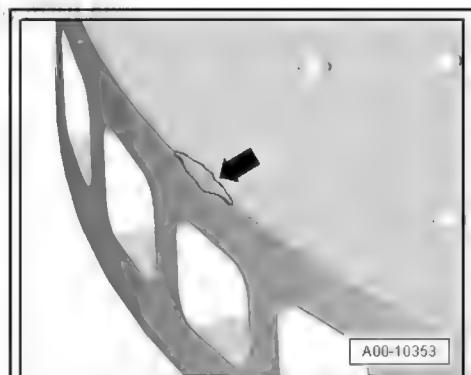
- ◆ max. width/depth = 2 mm
- ◆ max. length = 10 mm
- ◆ max. 3 edge fractures per brake disc

Renew the ceramic brake discs if the specified limits have been exceeded.



#### WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.



## 5.9 Chipping on ceramic brake discs

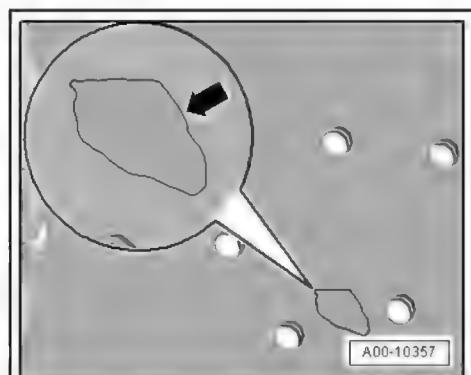
Renew the ceramic brake discs if the following types of damage have occurred:

- ◆ Chipping (larger than 1 cm<sup>2</sup> -arrow-) on the friction surface



#### WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.



## 5.10 Cracks extending into cooling channels

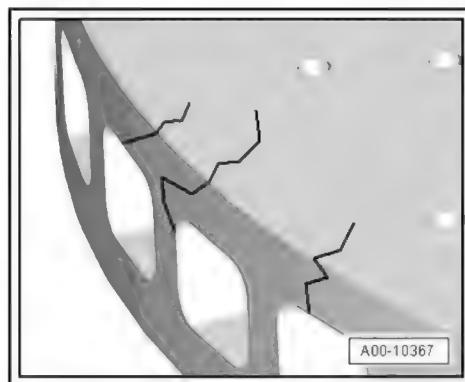
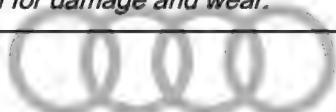
Renew the ceramic brake discs if the following types of damage have occurred:

- ◆ A crack extending from the friction surface of the brake disc to the cooling channel or through the cooling channel



### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*



## 5.11 Assessing degree of wear on ceramic brake discs

⇒ [“5.11.1 Assessing degree of wear”, page 14](#)

⇒ [“5.11.2 Wear assessment by checking thickness of brake disc”, page 15](#)

⇒ [“5.11.4 Wear assessment by weighing brake disc”, page 18](#)

⇒ [“5.11.5 Wear assessment by weighing brake disc \(if minimum weight is stamped on hub\)”, page 20](#)

⇒ [“5.11.6 Wear assessment according to wear indicators”, page 21](#)

⇒ [“5.12 Wear assessment with tester VAS 6813 ”, page 22](#)

### 5.11.1 Assessing degree of wear

- The brake disc must first be cleaned before assessing the degree of wear as described below.



### Note

*The brake disc ventilation drillings must be completely free of brake dust and dirt. Clear out carefully with a suitable tool if necessary. Do not use force.*



### WARNING

*Risk to health*

- ◆ *Always observe respiratory protection requirements when cleaning ceramic brake discs using compressed air.*

- Thoroughly blow out the brake discs with compressed air (including the area between the cooling channels and ventilation drillings).

- To assess the brake disc wear, proceed as follows:

- ◆ 1. Wear assessment by checking thickness of brake disc
- ◆ 2. Wear assessment according to wear indicators
- ◆ 3. Wear assessment by weighing brake disc

1. Wear assessment by checking thickness of brake disc ⇒ page 15	
Thickness of brake discs in permissible range → brake disc OK	
Brake disc thickness in critical range min. th + 0.2 mm	Value at or below limit
↓↓	↓↓
Further wear assessment according to wear indicators	Renew brake disc
↓↓	-----
2. Wear assessment according to wear indicators ⇒ page 21	
None of the six wear indicators fully worn out → brake disc OK	
-----	One of the six wear indicators fully worn out
○○○	↓↓
	Renew brake disc

Further wear assessment:

⇒ "5.11.4 Wear assessment by weighing brake disc", page 18



#### WARNING

##### Accident risk (insufficient braking effect)

- ◆ Ceramic brake discs must be renewed when one of the wear limits defined below has been reached. It is no longer permissible to use these brake discs.

##### Accident risk (uneven braking effect)

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

## 5.11.2 Wear assessment by checking thickness of brake disc



Note

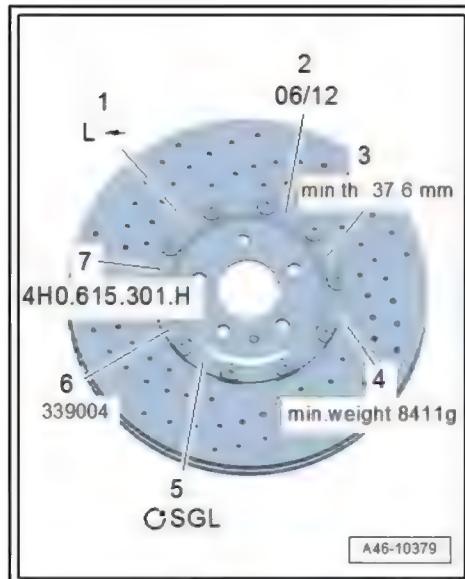
- ◆ New measurement tolerance of +0.05 mm for brake discs with "min. weight" stamped on the hub
- ◆ ⇒ "5.11.3 Wear assessment by checking thickness of brake disc (if minimum weight is stamped on hub)", page 17

Special tools and workshop equipment required

- ◆ Commercially available caliper gauge or micrometer gauge

### Procedure

- The minimum permissible thickness of the brake disc is engraved as "min.th." -item 3- on the brake disc hub.

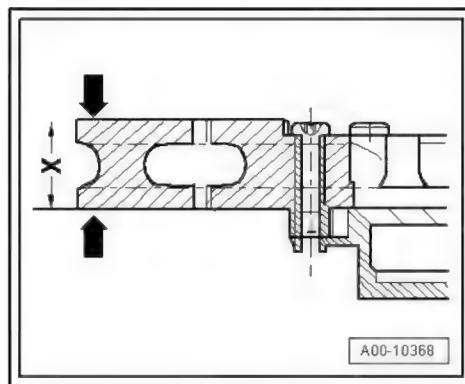


- Measure the thickness  $-x-$  of the brake disc next to each wear indicator all around the brake disc (three times).



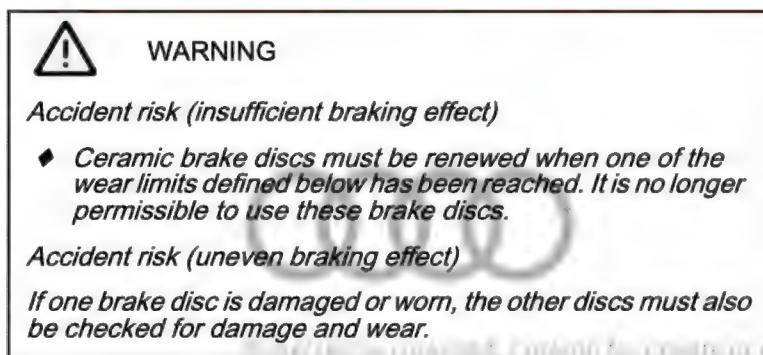
Note

If the thickness is down to  $x = \text{min. th.} + 0.2 \text{ mm}$ , additionally check the wear of the brake disc by inspecting the wear indicators  
[⇒ page 21](#).



Note

- New measurement tolerance of  $+0.05 \text{ mm}$  for brake discs with "min. weight" stamped on the hub
- ⇒ ["5.11.3 Wear assessment by checking thickness of brake disc \(if minimum weight is stamped on hub\)", page 17](#)



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### 5.11.3 Wear assessment by checking thickness of brake disc (if minimum weight is stamped on hub)



#### Note

*The minimum weight of the brake disc is stamped onto the brake disc hub; the tolerance for the thickness of the disc is only +0.05 mm.*

Special tools and workshop equipment required

- ◆ Commercially available caliper gauge or micrometer gauge

#### Procedure

- The minimum permissible thickness of the brake disc is engraved as "min.th." -item 3- on the brake disc hub.

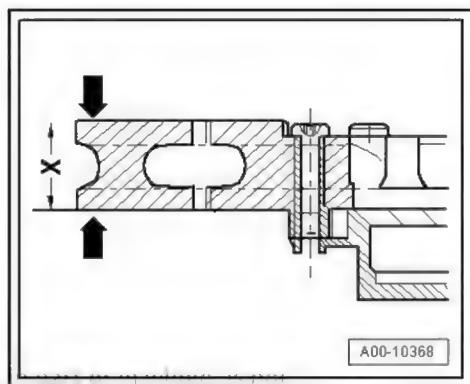


- Measure the thickness  $-x-$  of the brake disc next to each wear indicator all around the brake disc (three times).



#### Note

- ◆ *For these brake discs, the tolerance is considerably smaller than for standard measurement.*
- ◆ *If the thickness is down to  $x = \text{min. th.}$  plus a tolerance of +0.05 mm, additionally check the wear of the brake disc by inspecting the wear indicators.*



If the thickness of the brake disc is less than or equal to the minimum permissible thickness "min.th.", do NOT continue using the brake disc. The brake disc must be renewed.



#### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

#### 5.11.4 Wear assessment by weighing brake disc



### Note

- ◆ New tolerance for brake discs with minimum weight stamped on hub
- ◆ ⇒ "5.11.5 Wear assessment by weighing brake disc (if minimum weight is stamped on hub)", page 20

#### **Special tools and workshop equipment required**

- ◆ Commercially available scales with a tolerance of  $\pm 1$  g



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### Procedure

- The minimum permissible weight of the brake disc is engraved as "min.weight" -item 4- on the brake disc hub.
- Remove brake disc for weighing.
- The brake disc must be cleaned and dry before it is weighed.



#### WARNING

##### Risk to health

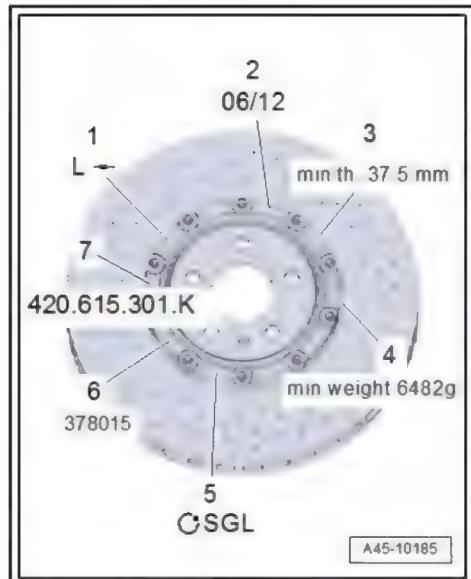
- Always observe respiratory protection requirements when cleaning ceramic brake discs using compressed air.



#### Caution

##### Risk of incorrect measurements

- DO NOT clean the brake disc with water or other fluids.



#### Note

- The brake disc ventilation drillings must be completely free of dirt. Clear out carefully with a suitable tool if necessary.
- Thoroughly blow out the brake discs with compressed air (including the area between the cooling channels and ventilation drillings).
- Carefully place the clean brake disc on the scales.



#### Note

If the weight loss is only 20 g within this limit, additionally check the wear of the brake disc according to the wear indicators  
[⇒ page 21](#).



#### Note

- New tolerance for brake discs with minimum weight stamped on hub
- [⇒ "5.11.5 Wear assessment by weighing brake disc \(if minimum weight is stamped on hub\)", page 20](#)



#### WARNING

*Accident risk (insufficient braking effect)*

- ◆ Ceramic brake discs must be renewed when one of the defined wear limits has been reached. It is no longer permissible to use these brake discs.

*Accident risk (uneven braking effect)*

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

#### 5.11.5 Wear assessment by weighing brake disc (if minimum weight is stamped on hub)



#### Note

- ◆ The minimum permitted weight of the brake disc is stamped onto the brake disc hub; no tolerance is permitted. The brake disc must be renewed if its weight is less than the indicated minimum weight.
- ◆ It is not necessary to perform any further wear assessment of the brake disc.

Brake disc with minimum weight stamped on hub:

Special tools and workshop equipment required

- ◆ Commercially available scales with a tolerance of  $\pm 1$  g

Procedure

- Remove brake disc for weighing.
- The brake disc must be cleaned and dry before it is weighed.



#### WARNING

*Risk to health*

- ◆ Always observe respiratory protection requirements when cleaning ceramic brake discs using compressed air.



#### Caution

*Risk of incorrect measurements*

- ◆ DO NOT clean the brake disc with water or other fluids.



Note

- ◆ The brake disc ventilation drillings must be completely free of dirt. Clear out carefully with a suitable tool if necessary.
- ◆ Thoroughly blow out the brake discs with compressed air (including the area between the cooling channels and ventilation drillings).
- Carefully place the clean brake disc on the scales.



Note

- ◆ The minimum permitted weight of the brake disc is stamped onto the brake disc hub; there is no tolerance. The disc must be renewed if the weight of the disc is less than or equal to the indicated minimum weight.
- ◆ It is not necessary to perform any further wear assessment of the brake disc.



**WARNING**

*Accident risk (insufficient braking effect)*

- ◆ Ceramic brake discs must be renewed when one of the defined wear limits has been reached. It is no longer permissible to use these brake discs.

*Accident risk (uneven braking effect)*

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

### 5.11.6 Wear assessment according to wear indicators

Wear indicators are positioned at intervals of 120 degrees on the friction surface of the brake disc.

- ◆ The wear indicators -arrow- appear in a different colour.
- ◆ There are three wear indicators on each side of the brake disc (front and reverse side).
- ◆ With increasing brake disc wear, a dark burnt-out recess appears at the wear indicators.

If one of the wear indicators is completely burnt out, the brake disc must be renewed.



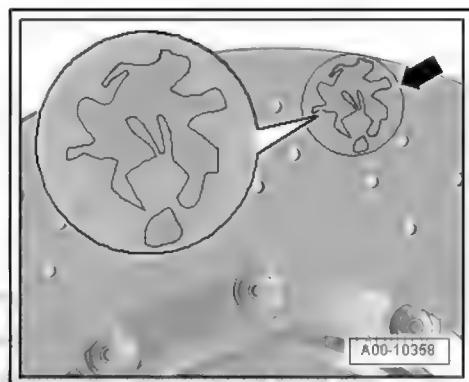
**WARNING**

*Accident risk (insufficient braking effect)*

- ◆ Ceramic brake discs must be renewed when one of the defined wear limits has been reached. It is no longer permissible to use these brake discs.

*Accident risk (uneven braking effect)*

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*



## 5.12 Wear assessment with tester - VAS 6813-

⇒ "5.12.2 Checking tester VAS 6813 ", page 24  
⇒ "5.12.3 Wear assessment with tester VAS 6813 ", page 25

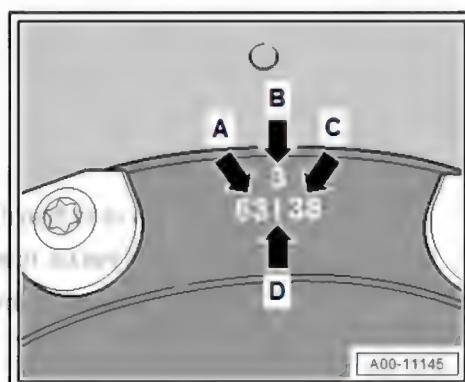
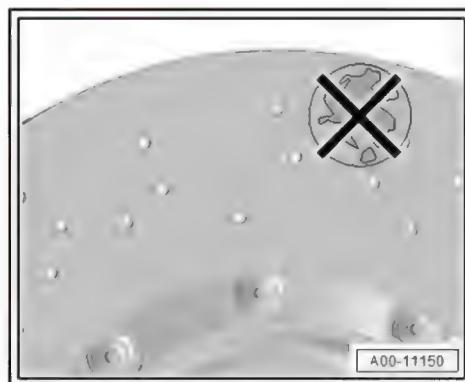


Note

*This is a new method for measuring the wear limit of ceramic brake discs.*

⇒ "5.12.4 Notes on brake disc wear limit", page 27

You can identify the brake disc as follows:



- ◆ The wear indicators -arrow- on the friction surface of the brake disc are no longer visible
- ◆ By looking at the laser-etched markings -A to D-



Note

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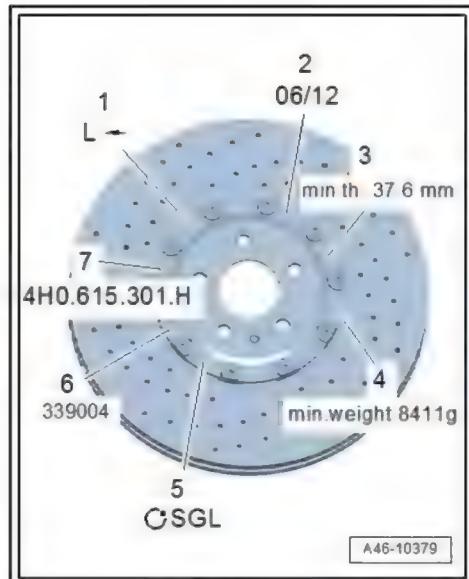
- ◆ *The degree of wear is determined by measuring the brake disc thickness AND the wear value using the tester - VAS 6813-; both values must be measured three times each.*
- ◆ *The minimum permissible thickness of the brake disc is engraved as "min.th." on the brake disc hub.*
- ◆ *The wear value -C- of the brake disc for the tester - VAS 6813- is engraved on the brake disc hub.*
- ◆ *Value -A- is a value from the production of the new brake disc.*
- ◆ *Values -A and C- may vary depending on the measuring point.*
- ◆ *Values -A and C- may vary depending on the brake disc.*

Example of minimum brake disc thickness (min.th. -3-); the brake disc thickness must not be less than this value.



Note

*Value -3- may vary depending on the brake disc.*



### 5.12.1 Checking brake disc thickness

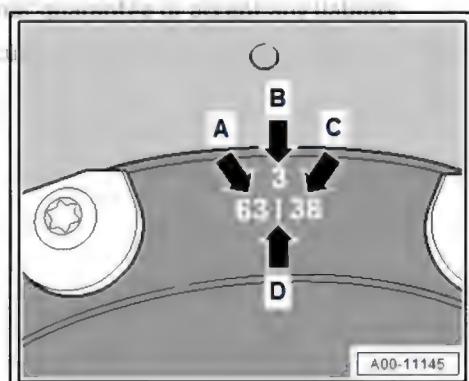
⇒ "5.12.4 Notes on brake disc wear limit", page 27

The markings for measuring the degree of wear are spaced at intervals of 120°.

Measure the brake disc thickness at these three points.

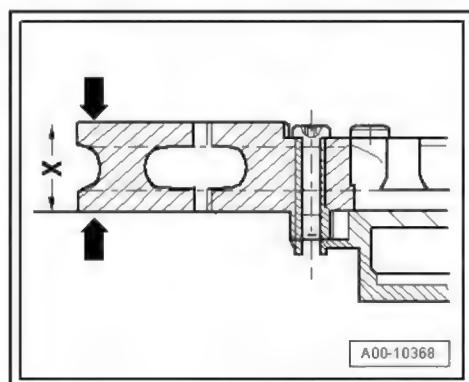
Example shows third measuring point

The minimum permissible thickness of the brake disc is engraved as "min.th." on the brake disc hub.



- Measure the thickness  $x$  of the brake disc at the measuring points all around the brake disc (three times).

If the thickness of the brake disc is below the "min.th." value at one of the measuring points, the brake disc must be renewed.

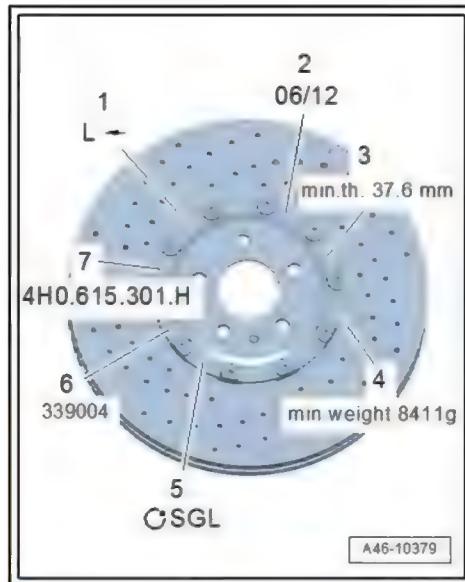


Example of minimum brake disc thickness (min.th. -3-); the brake disc thickness must not be less than this value.



*Value -3- may vary depending on the brake disc.*

If the thickness of the brake disc is not below the minimum value, proceed to  
⇒ "["5.12.3 Wear assessment with tester VAS 6813 "](#), page 25 .



### 5.12.2 Checking tester - VAS 6813-

Before taking measurements, the tester - VAS 6813- must be checked using the measuring plate provided.

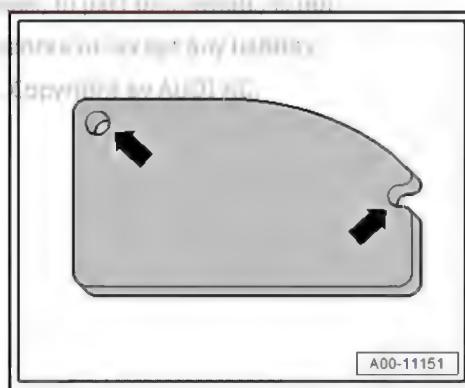
Measuring plate:

- Place tester in both openings -arrows- of measuring plate so that laser beam points downwards towards marking with affixed reference value.,
- Switch on tester.

The value now shown must correspond to the reference value affixed to the measuring plate.



- ◆ If the value shown differs from the reference value by more than  $\pm 2.0$  units, the tester must be re-calibrated by the supplier.
- ◆ Please refer to the enclosed instructions for further information.



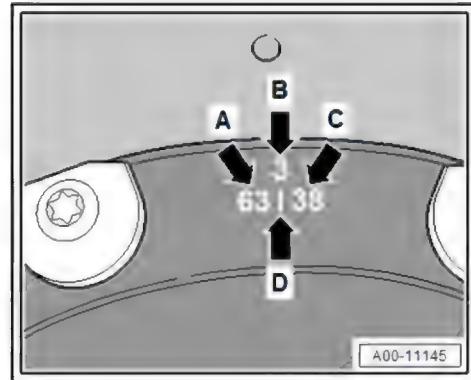
### 5.12.3 Wear assessment with tester - VAS 6813-



#### Note

- ◆ The degree of wear is determined by measuring the brake disc thickness AND the wear value using the tester - VAS 6813- ; both values must be measured three times each.
- ◆ The wear value -C- for the tester - VAS 6813- is engraved on the brake disc hub.
- ◆ Values -A and C- may vary depending on the measuring point.
- ◆ Values -A and C- may vary depending on the brake disc.
- ◆ Value -A- is a value from the production of the new brake disc.

- Wheel has been removed.
- Brake disc thickness has been checked.
- Tester has been checked  
⇒ ["5.12.2 Checking tester VAS 6813", page 24](#) .



A00-11145

#### Special tools and workshop equipment required

- ◆ Tester - VAS 6813-

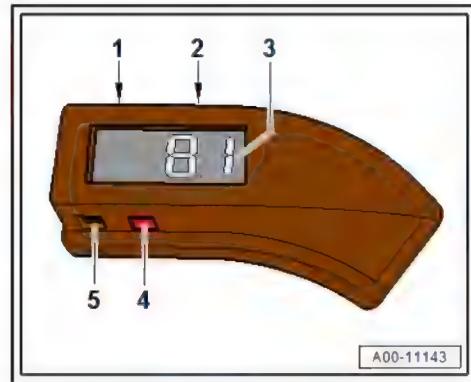
#### Tester - VAS 6813- :

- ◆ 1 ON/OFF switch
- ◆ 2 Button for taking measurement
- ◆ 3 Display for measurement
- ◆ 4 Laser beam for positioning
- ◆ 5 Interface



#### Note

Please refer to the enclosed instructions for further information about the tester - VAS 6813- .



A00-11143

#### Measurement:

- ◆ The brake disc must be clean.
- ◆ The brake disc must be dry.

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#### Risk to health

- ◆ Always observe respiratory protection requirements when cleaning ceramic brake discs using compressed air.
- ◆ DO NOT clean the brake disc with water or other fluids.

The markings for measuring the degree of wear are spaced at intervals of 120°.

The measuring procedure described below must be performed at all three measuring points to ensure that the degree of wear is determined reliably.

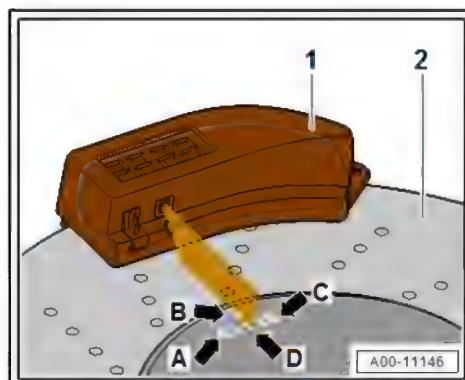
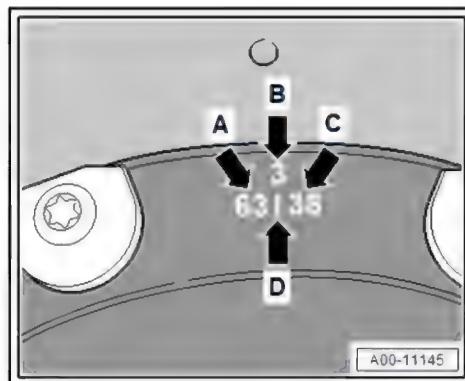
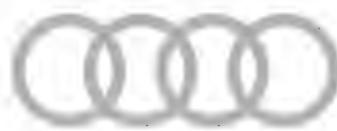
-A-: new value, -C-: wear value, -B-: measuring point number,  
 -D-: marking for laser beam for measuring wear value.

The third measuring point -B- (of points 1 to 3) can be seen in the example.

 Note

- ◆ Values -A and C- vary depending on the measuring point.
- ◆ Values -A and C- vary depending on the brake disc.

- Place tester - VAS 6813- at outer edge of brake disc so that it is flush.
- Switch on tester - VAS 6813- .
- Move tester - VAS 6813- -1- along outer edge -2- until laser beam points exactly towards marking -D- on brake disc.
- Measure wear at all three measuring points (1 to 3) on brake disc.
- To do so, read off value displayed on tester - VAS 6813- .

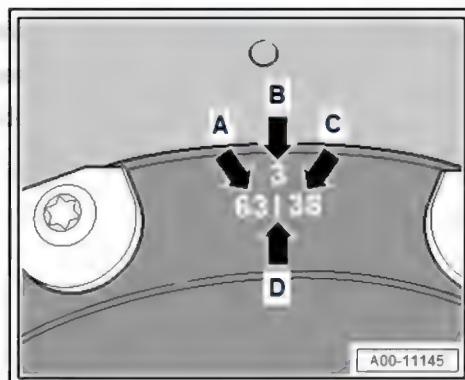


The brake disc must be removed and checked further for wear if the value is less than or equal to one of the three wear values -C- .

 Note

Wear value -C- varies depending on the measuring point.

- Remove brake disc.
- [⇒ "5.12.2 Checking tester VAS 6813 ", page 24](#)



 Note

- ◆ To ensure that the following measurement is completely accurate, place the brake disc on a non-conductive surface (e.g. wooden table).
- ◆ The surface must be clean and dry.
- ◆ The brake disc must be clean and dry.

- Place tester - VAS 6813- at outer edge of brake disc again so that it is flush.

The measuring procedure must be performed at all three measuring points to ensure that the degree of wear is determined reliably.

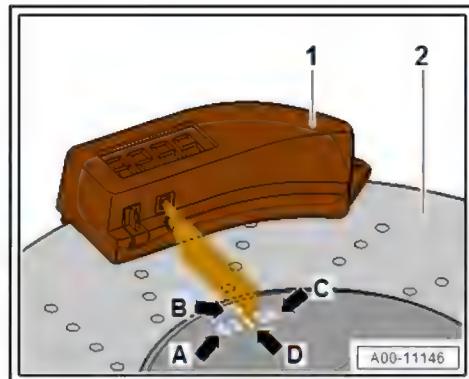
- Move tester - VAS 6813- -1- along outer edge -2- until laser beam points exactly towards marking -D- on brake disc.
- Measure wear at all three measuring points (1 to 3) on brake disc.
- To do so, read off value displayed on tester - VAS 6813- .

The brake disc must be renewed if the value is less than or equal to one of the three wear values -C- .



#### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

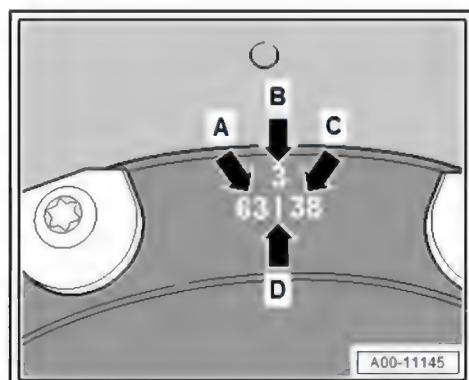


#### 5.12.4 Notes on brake disc wear limit



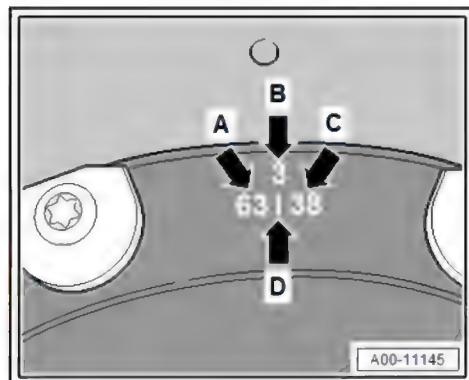
##### Note

- The degree of wear is determined by measuring the brake disc thickness AND the wear value using the tester - VAS 6813- ; both values must be measured three times each.
- The brake disc hub is engraved with the minimum permissible thickness of the brake disc ("min.th.") and the wear value -C- for the tester - VAS 6813- .
- The wear value -C- varies depending on the brake disc and the measuring point.



##### Note

- If the thickness of the brake disc is below the "min.th." value at one of the measuring points, the brake disc must be renewed [⇒ "5.12.1 Checking brake disc thickness", page 23](#).
- "Or"
- If the value is less than or equal to one of the three wear values -C- when determining the degree of wear with the tester - VAS 6813- , the brake disc must be renewed  
[⇒ "5.12.3 Wear assessment with tester VAS 6813", page 25](#).



##### Note

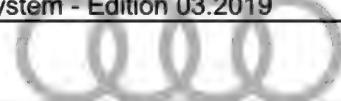


The wear value -C- varies depending on the brake disc.



#### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*



## 45 – Anti-lock brake system

### 1 General notes

⇒ “1.1 Notes for repair work on the ABS”, page 28

#### 1.1 Notes for repair work on the ABS

Malfunctions in the ABS system do not influence the brake system and servo action. The conventional braking system remains functional even without ABS. However, the vehicle's braking behaviour can change. After the ABS warning lamp comes on, the rear wheels can lock early when braking.



#### WARNING

- ◆ *The anti-lock brake system is always maintenance-free.*
- ◆ *Testing, removing, installing and repair work may only be performed by qualified personnel.*
- ◆ *Failure to observe the information described in this Workshop Manual may result in damage to the system and could make the vehicle unsafe.*

#### Vehicles with high-voltage system



#### WARNING

*Note general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*

#### All vehicles

- ◆ Before carrying out repair work on the anti-lock brake system, determine the cause of the problem using self-diagnosis.
- ◆ When installing a new hydraulic control unit, always check its coding ⇒ Vehicle diagnostic tester.
- ◆ With ignition switched off, disconnect battery earth strap.
- ◆ When working with brake fluid, observe the relevant safety precautions and notes ⇒ [page 272](#) .
- ◆ Always bleed the brake system (using brake filling and bleeding equipment - VAS 5234- ) after all work which involves opening the hydraulic system. In addition, a high- and low-pressure test should be carried out on the brake system ⇒ [page 280](#) .
- ◆ During the final road test, ensure that at least one ABS-controlled braking operation is performed (pulsations must be felt at the brake pedal) ⇒ Vehicle diagnostic tester.

## 2 Overview of fitting locations

⇒ "2.1 Overview of fitting locations - ABS/ESP", page 29

### 2.1 Overview of fitting locations - ABS/ESP

1 - Rear right speed sensor - G44-

- Checking ⇒ Vehicle diagnostic tester, [Guided Fault Finding](#)
- Exploded view  
⇒ [page 50](#)

2 - Rear left speed sensor - G46-

- Checking ⇒ Vehicle diagnostic tester, [Guided Fault Finding](#)
- Exploded view  
⇒ [page 50](#)

3 - Control unit for sensor electronics - J849-

- Fitting location: under extension of centre console
- Checking ⇒ Vehicle diagnostic tester, [Guided Fault Finding](#)
- Removing and installing  
⇒ [page 54](#)

4 - Brake light switch - F-

- Fitting location: on brake pedal
- Removing and installing  
⇒ [page 51](#)

5 - Brake pedal

- Exploded view  
⇒ [page 205](#)

6 - Diagnostic connection

- Fitting location ⇒ [page 30](#)

7 - Front left speed sensor - G47-

- Checking ⇒ Vehicle diagnostic tester, [Guided Fault Finding](#)
- Exploded view ⇒ [page 49](#)

8 - ABS hydraulic unit - N55- with ABS control unit - J104-

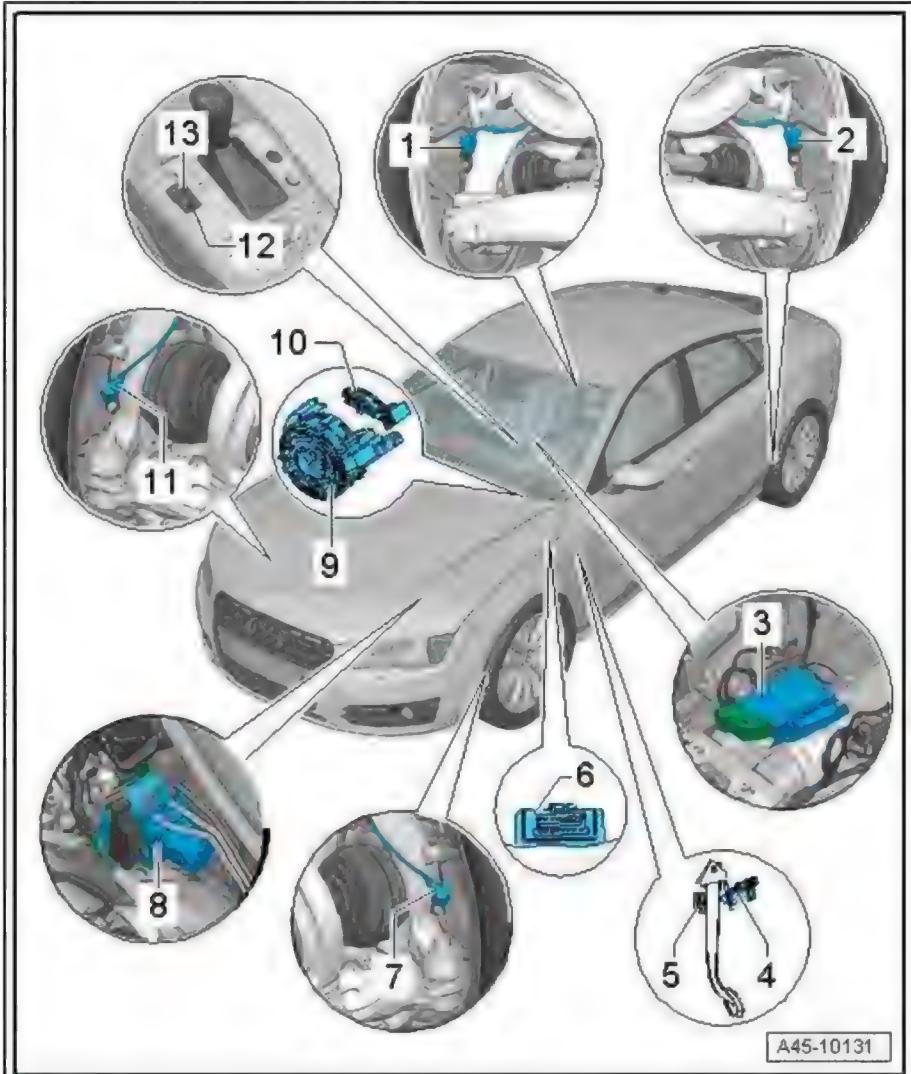
- The hydraulic unit and the control unit together form the hydraulic control unit.
- Exploded view ⇒ [page 31](#)

9 - Steering column electronics control unit - J527-

- With airbag coil connector and return ring with slip ring - F138- and steering angle sender - G85-
- Removing and installing ⇒ Electrical system; Rep. gr. 94 ; Steering column switch module; Removing and installing steering column electronics control unit - J527-

10 - Return ring

- Fitting location: installed with slip ring on steering column



11 - Front right speed sensor - G45-

- Checking ⇒ Vehicle diagnostic tester, [Guided Fault Finding](#)
- Exploded view [⇒ page 49](#)

12 - Auto-hold button - E540-

- Fitting location: in centre console
- Removing and installing ⇒ Electrical system; Rep. gr. 96 ; Controls; Removing and installing electro-mechanical parking brake button - E538- / auto-hold button - E540-

13 - Electromechanical parking brake button - E538-

- Fitting location: in centre console
- Removing and installing ⇒ Electrical system; Rep. gr. 96 ; Controls; Removing and installing electro-mechanical parking brake button - E538- / auto-hold button - E540-

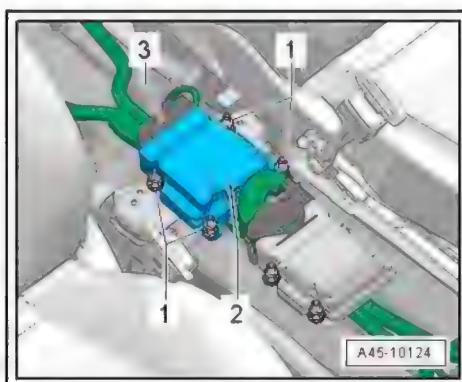
Fitting location of diagnostic connection

- ◆ Fitting location: Diagnostic connection for vehicle diagnostic tester is located in driver's footwell.



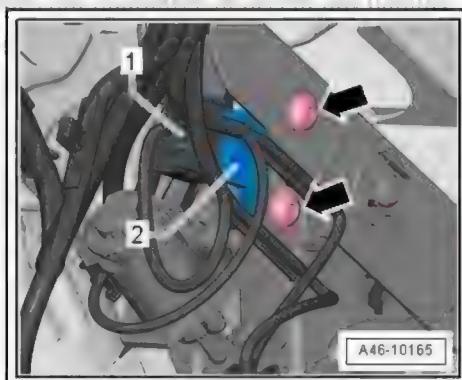
Control unit for sensor electronics - J849- - tightening torque

- Tighten nuts -1- to 9 Nm.



Brake pedal position sender - G100- - tightening torque

- Tighten bolts -arrows- to 8 Nm.



### 3 Control unit and hydraulic unit

⇒ "3.1 Exploded view - control unit and hydraulic unit",  
page 31

⇒ "3.2 Removing and installing ABS control unit J104 / ABS hy-  
draulic unit N55 ", page 33

⇒ "3.3 Separating control unit from hydraulic unit", page 44

⇒ "3.4 Attaching control unit to hydraulic unit", page 46

#### 3.1 Exploded view - control unit and hydraulic unit

1 - Nut

- 9 Nm

2 - Bolt

- 20 Nm

3 - Bolt

- 4.5 Nm

4 - ABS control unit - J104-

- Fitting location:

- ◆ Vehicles without high-volt-  
age system ⇒ page 32
- ◆ Vehicles with high-voltage  
system ⇒ page 32
- Separating control unit  
from hydraulic unit  
⇒ page 44
- Attaching control unit to  
hydraulic unit  
⇒ page 46

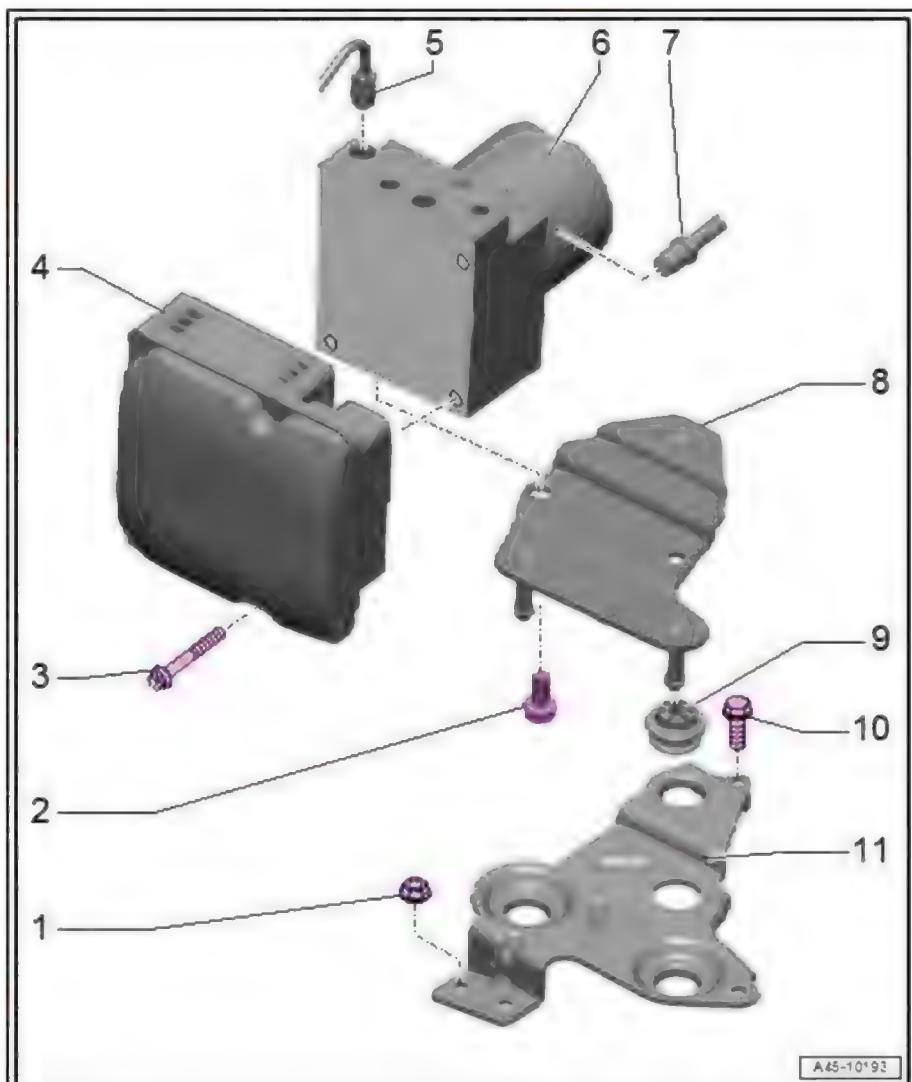
5 - Brake line

- Do not alter shape
- Tightening torque  
⇒ page 266

6 - ABS hydraulic unit - N55-

- Fitting location:

- ◆ Vehicles without high-volt-  
age system ⇒ page 32
- ◆ Vehicles with high-voltage  
system ⇒ page 32
- Removing and installing  
⇒ page 33



##### Caution

The pump motor must  
not be unbolted from the  
hydraulic unit.

7 - Brake line

- Do not alter shape
- Tightening torque ⇒ page 266

8 - Bracket

9 - Buffer

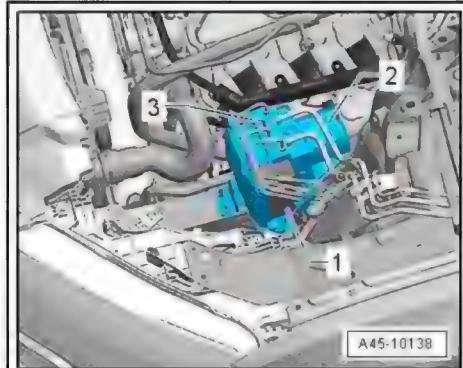
10 - Bolt

□ 9 Nm

11 - Bracket

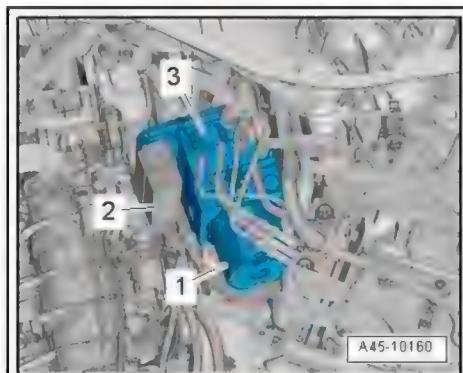
Fitting location of ABS control unit - J104- / ABS hydraulic unit - N55- - vehicles without high-voltage system

Hydraulic unit -2- with control unit -3- and electrical connection -1- is located at front left of engine compartment under coolant expansion tank.



Fitting location of ABS control unit - J104- / ABS hydraulic unit - N55- - vehicles with high-voltage system

Hydraulic unit -2- with control unit -3- and electrical connection -1- is located at front left of engine compartment under coolant expansion tank.



ABS control unit - J104-



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**1 - Pressure sensor contact**

- Never touch the contacts
- Some versions may differ from this illustration

**2 - Pressure sensor**

- Must not be modified or damaged
- Cannot be replaced
- Some versions may differ from this illustration

**3 - Seal**

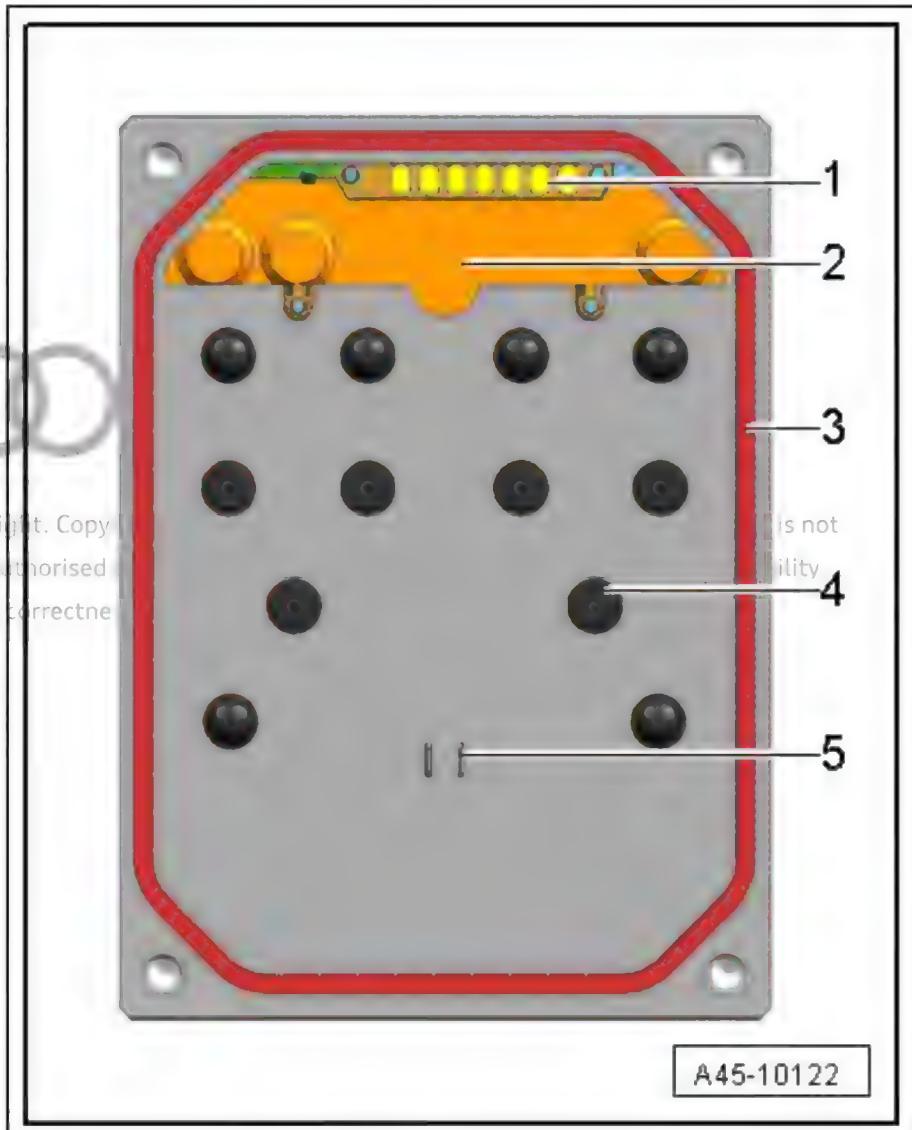
- Do not lift or pull out seal
- Cannot be replaced

**4 - Contact pins** Protected by copyright. Copying or unauthorized use is illegal.

- Must not be damaged or bent
- Never apply tools with respect to the correctness of the connection

**5 - Contact for pump motor**

- Must not be damaged or bent



### 3.2 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55-

⇒ "3.2.1 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 - vehicles without high-voltage system",  
[page 33](#)

⇒ "3.2.2 Removing and installing ABS control unit J104 / ABS hydraulic unit N55 - vehicles with high-voltage system",  
[page 39](#)

#### 3.2.1 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- - vehicles without high-voltage system



Note

When renewing ABS control unit - J104- / ABS hydraulic unit - N55- , select the "Replace" function for the ABS control unit - J104- / ABS hydraulic unit - N55- using ⇒ Vehicle diagnostic tester, [Guided Functions](#).

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Brake pedal actuator - V.A.G 1869/2-



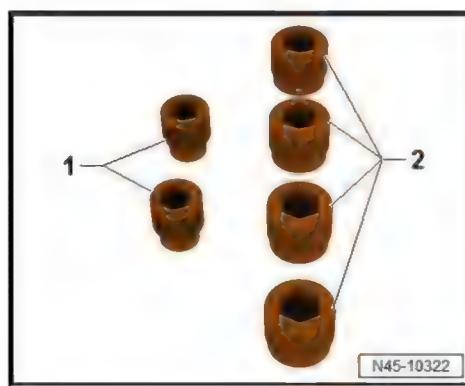
- ◆ Reservoir from brake filling and bleeding equipment - VAS 5234-



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- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



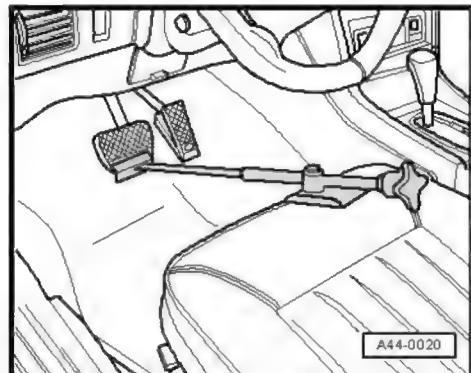
- 1 - M10 sealing plugs
- 2 - M12 sealing plugs

## Removing

- Switch off ignition.
- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal by at least 60 mm.



*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*



## WARNING

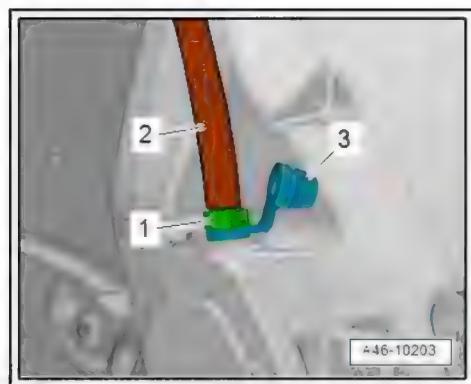
### Risk of skin irritation

- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.

- Detach protective cap -3- from bleeder screw -1- on front left brake caliper.
- Connect hose -2- from reservoir as shown in illustration.
- Open bleeder screw to relieve pressure in brake system.
- Close bleeder screw and remove reservoir.
- Repeat procedure on rear left brake caliper.

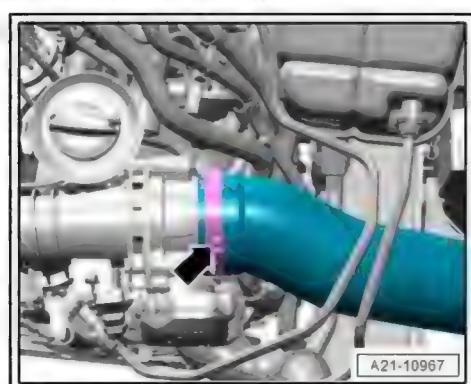


*The brake pedal actuator - V.A.G 1869/2- must not be removed.*



### Vehicles with 3.0 ltr. TDI engine:

- Release hose clip -arrow- and disconnect air hose.

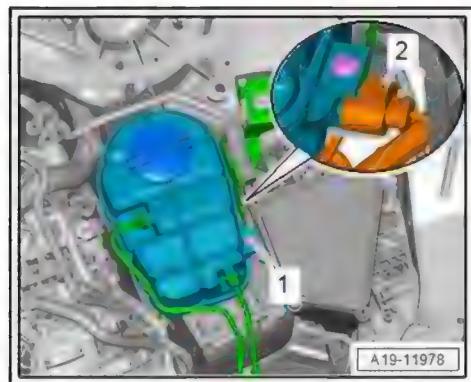


### All vehicles (continued):

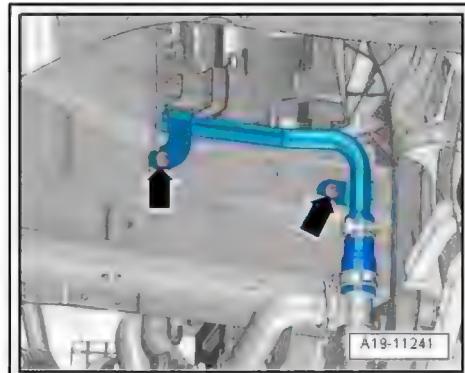
- Remove bolt -1- and detach coolant expansion tank.
- Unplug electrical connector -2- and move coolant expansion tank to one side with coolant hoses connected.



*Illustration shows installation position on a vehicle with 3.0 ltr. TDI evo engine as an example.*



- Remove nuts -arrows- and move coolant pipe clear at longitudinal member.





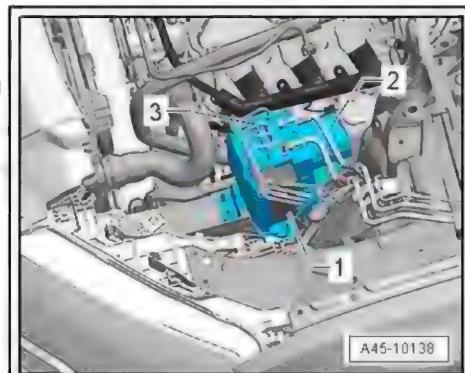
- To protect against escaping brake fluid, place a sufficient number of lint-free cloths in area beneath control unit and hydraulic unit.
- **Mark brake lines for subsequent installation.**
- **Detach brake lines from brackets.**
- Unscrew all brake lines from hydraulic unit -2-.



**Caution**

**Risk of damage to brake lines**

- ◆ **Do not bend the brake lines in the vicinity of the hydraulic unit.**



- Seal brake lines and threaded holes using sealing plugs from assembly parts set - 5Q0 698 311- .
- Release electrical connector -1- and unplug connector from control unit -3-.



**Note**

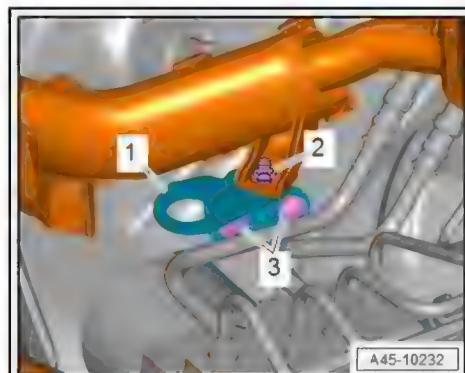
- ◆ **Make sure brake fluid does not get into connector housing of control unit. This can result in corrosion of the contacts and failure of the system.**
- ◆ **Use compressed air to carefully clean connector housing if necessary.**

Vehicles with 3.0 ltr. TDI evo engine:

- Unscrew nut -2-.

All vehicles (continued):

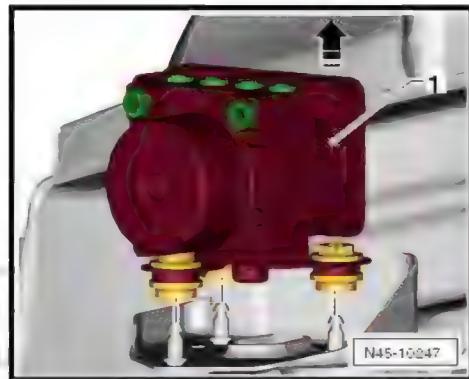
- Remove bolts -3- and detach bracket -1-.



- Lift ABS hydraulic unit - N55- -1- with ABS control unit - J104- and bracket off in direction of -arrow- and remove from engine compartment.



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Remove bolts -arrows- and detach bracket -1-.



#### Caution

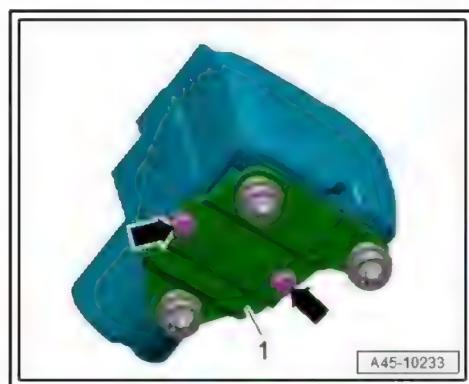
##### *Risk of irreparable damage to hydraulic unit*

- ◆ *The pump motor must not be unbolted from the ABS hydraulic unit - N55-*



#### Note

- ◆ *Only the ABS control unit - J104- may be renewed separately  
⇒ page 44 .*
- ◆ *It is permissible to fit a new ABS control unit - J104- to the  
existing hydraulic unit.*
- ◆ *It is not permissible to fit the existing ABS control unit - J104-  
to a new hydraulic unit.*
- ◆ *If the ABS hydraulic unit - N55- is defective, it must always be  
renewed together with the ABS control unit - J104- .*



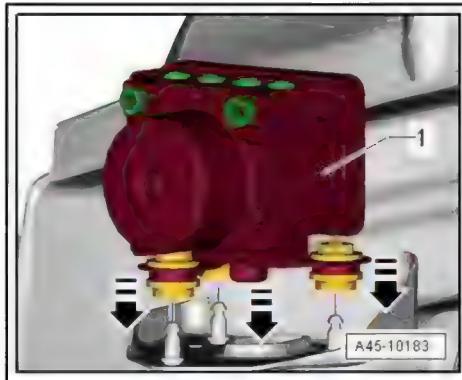
#### Installing

Installation is carried out in reverse order; note the following:

- Press ABS hydraulic unit - N55- with ABS control unit - J104- and bracket onto studs in engine compartment in direction of -arrows-.
- ABS hydraulic unit - N55- with ABS control unit - J104- must be seated on all studs.

 Note

- ◆ *Do not remove sealing plugs from new hydraulic unit until corresponding brake line is ready to be fitted.*
- ◆ *If the sealing plugs are removed from the hydraulic unit sooner, brake fluid may escape and it may no longer be possible to fill and bleed the unit properly.*
- ◆ *When installing the hydraulic unit, ensure that the rubber dampers are not pressed out of the bracket.*



- Remove sealing plugs from new hydraulic unit.

 Note

*To facilitate installation, first insert all the brake lines in the hydraulic unit and then tighten the brake line connections.*

- Insert all brake lines.
- Secure all brake line connections.
- Perform final control diagnosis after securing brake lines to hydraulic unit ⇒ Vehicle diagnostic tester.

 Note

*Final control diagnosis can be used to establish whether line connections have been interchanged.*

- Press brake lines into brackets.
- Plug in electrical connector under coolant expansion tank.
- Secure coolant expansion tank to bracket with coolant hoses connected.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system ⇒ [page 273](#) .

 Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*
- When renewing ABS control unit - J104- / ABS hydraulic unit - N55- , select the "Replace" function for the ABS control unit - J104- / ABS hydraulic unit - N55- using ⇒ Vehicle diagnostic tester, [Guided Functions](#).



### WARNING

*Risk of accident!*

- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

Tightening torques

- ◆ ⇒ “5.1 Connection points”, page 266

## 3.2.2 Removing and installing ABS control unit - J104- / ABS hydraulic unit - N55- - vehicles with high-voltage system



### Note

When renewing ABS control unit - J104- / ABS hydraulic unit - N55- , select the “Replace” function for the ABS control unit - J104- / ABS hydraulic unit - N55- using ⇒ Vehicle diagnostic tester, Guided Functions.

Special tools and workshop equipment required

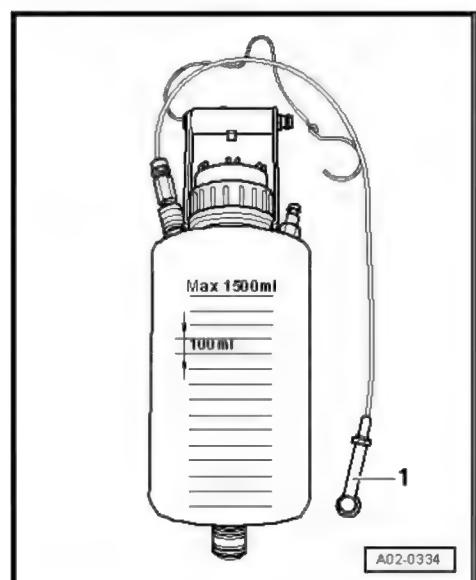
- ◆ Vehicle diagnostic tester
- ◆ Brake pedal actuator - V.A.G 1869/2-

VAG 1869/2

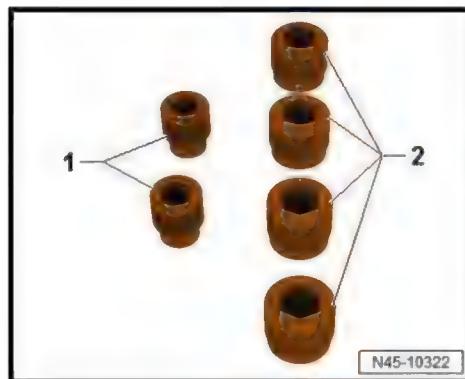


W00-11589

- ◆ Reservoir from brake filling and bleeding equipment - VAS 5234-



- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



1 - M10 sealing plugs

2 - M12 sealing plugs

#### Removing



#### WARNING

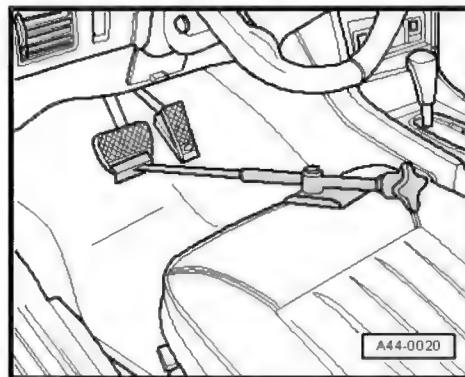
*Note general warning instructions for work on the high-voltage system → Electrical system, hybrid; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*

- Switch off ignition.
- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal by at least 60 mm.



#### Note

*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*



#### WARNING

##### Risk of skin irritation

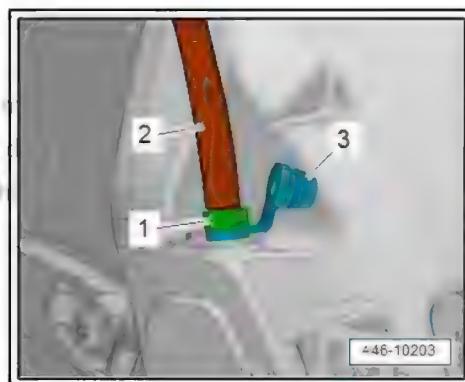
- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.

- Detach protective cap -3- from bleeder screw -1- on front left brake caliper.
- Connect hose -2- from reservoir as shown in illustration.
- Open bleeder screw to relieve pressure in brake system.
- Close bleeder screw and remove reservoir.
- Repeat procedure on rear left brake caliper.



#### Note

*The brake pedal actuator - V.A.G 1869/2- must not be removed.*



- Detach engine cover panel -arrows-.



#### WARNING

*Note general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*

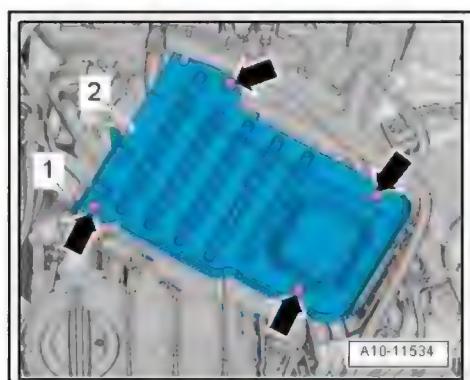


- Remove bolts -arrows- and detach cover -2-.



#### WARNING

*Note general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*



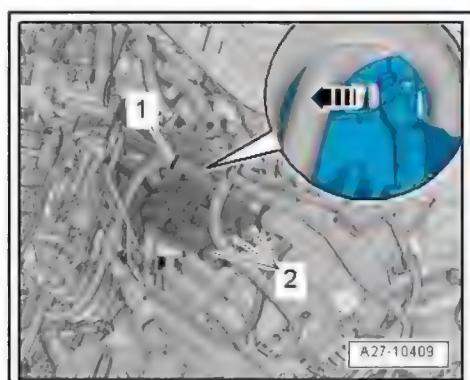
- Open catch -arrow- and move bracket with electrical wiring towards rear.
- Move electrical wire -1- clear.
- Detach electrical wiring -2- from power and control electronics for electric drive - JX1- ⇒ Electrical system, hybrid; Rep. gr. 93 ; Power and control electronics for electric drive; Removing and installing power and control electronics for electric drive .
- Unscrew bolt securing coolant expansion tank.
- Lift coolant expansion tank off bracket with coolant hoses connected.
- Unplug electrical connector under coolant expansion tank.
- Tie up coolant expansion tank on one side with coolant hoses connected.



#### Note

*Do not disconnect coolant hoses.*

- As protection against escaping brake fluid, place a sufficient number of lint-free cloths in area beneath control unit and hydraulic unit.
- Mark brake lines.
- Detach brake lines from brackets.



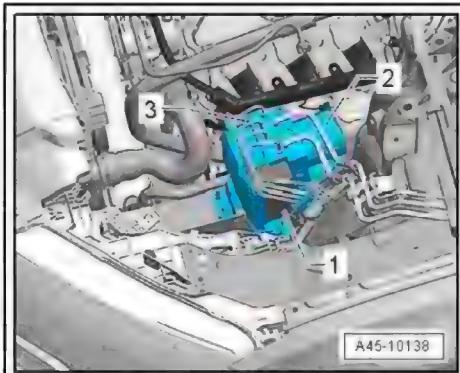
- Unscrew all brake lines from hydraulic unit -2-.



Caution

*Risk of damage to brake lines*

- ◆ *Do not bend the brake lines in the vicinity of the hydraulic unit.*



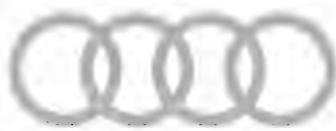
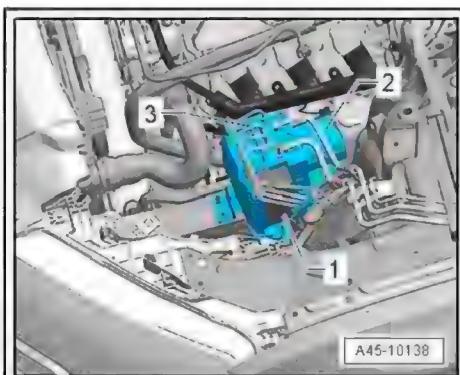
- Seal brake lines and threaded holes using sealing plugs from assembly parts set - 5Q0 698 311- .

- Release electrical connector -1- and unplug connector from control unit -3-.



Note

- ◆ *Make sure brake fluid does not get into connector housing of control unit. This can result in corrosion of the contacts and failure of the system.*
- ◆ *Use compressed air to carefully clean connector housing if necessary.*
- Detach hydraulic unit together with control unit from bracket in vehicle.



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- Remove bolt -2- and nut -3- and detach bracket -1-.

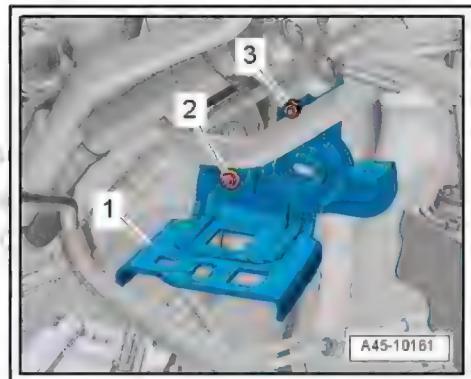
#### Installing

Installation is carried out in reverse order; note the following:



#### Note

- ◆ ***Do not remove sealing plugs from new hydraulic unit until corresponding brake line is ready to be fitted.***
- ◆ ***If the sealing plugs are removed from the hydraulic unit sooner, brake fluid may escape and it may no longer be possible to fill and bleed the unit properly.***



- Attach bracket to hydraulic unit.

- Insert hydraulic unit together with control unit in rubber mountings on bracket in vehicle.



#### Note

*To facilitate installation, moisten the rubber mountings in the bracket slightly with water.*

- Remove sealing plugs from new hydraulic unit.



#### Note

*To facilitate installation, first insert all the brake lines in the hydraulic unit and then tighten the brake line connections.*

- Insert all brake lines.
- Secure all brake line connections.
- Perform final control diagnosis after securing brake lines to hydraulic unit ⇒ Vehicle diagnostic tester.



#### Note

*Final control diagnosis can be used to establish whether line connections have been interchanged.*

- Press brake lines into brackets.
- Plug in electrical connector under coolant expansion tank.
- Fit coolant expansion tank with coolant hoses connected.
- Secure coolant expansion tank to bracket with coolant hoses connected.



#### WARNING

*Note general warning instructions for work on the high-voltage system ⇒ Electrical system, hybrid; Rep. gr. 93 ; General warning instructions for work on the high-voltage system .*

- Connect electrical wiring -2- to power and control electronics for electric drive - JX1- ⇒ Electrical system, hybrid; Rep. gr. 93 ; Power and control electronics for electric drive; Removing and installing power and control electronics for electric drive .

- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system [⇒ page 273](#) .



Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*
- When renewing ABS control unit - J104- / ABS hydraulic unit - N55- , select the "Replace" function for the ABS control unit - J104- / ABS hydraulic unit - N55- using ⇒ Vehicle diagnostic tester, [Guided Functions](#).



**WARNING**

*Risk of accident!*

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

Tightening torques

- ◆ [⇒ "5.1 Connection points", page 266](#)

### 3.3 Separating control unit from hydraulic unit

Control unit replacement

The control unit must be renewed:

- ◆ If a control unit fault has definitely been detected "Control unit defective" ⇒ Vehicle diagnostic tester.
- ◆ If there is visible damage to the control unit housing or connector.



**Caution**

*Following removal, a control unit must not be bolted onto a different hydraulic unit.*



Note

- ◆ *Before removing the control unit, read out the event memory and print out the fault code if applicable.*
- ◆ *The control unit and hydraulic unit can be separated.*
- ◆ *The ABS hydraulic unit - N55- and the ABS control unit - J104- must be removed in order to separate the control unit from the hydraulic unit.*

The control unit may only be replaced by suitably qualified personnel.

- ◆ Use only the new components specified in the repair kit.
- ◆ Always use new bolts for attaching the control unit to the hydraulic unit.

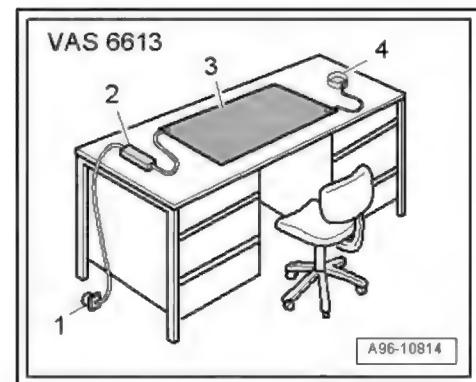
- ◆ The seal on the control unit must not be lifted or pulled out.
- ◆ The seal on the control unit cannot be replaced.
- ◆ Do not blow out the control unit or hydraulic unit with compressed air.
- ◆ The valve coils in the control unit cannot be re-adjusted.
- ◆ The valve coils in the control unit cannot be replaced.
- ◆ The pressure sensor must not be modified or damaged
- ◆ The pressure sensor cannot be replaced
- ◆ Never subject the sensor housing to mechanical load.
- ◆ Never take measurements at the contact points in the control unit.
- ◆ Never take measurements at the contact points in the hydraulic unit.
- ◆ The contact pins in the hydraulic unit must not be damaged or bent.
- ◆ The contacts cannot be replaced.
- ◆ The use of contact sprays on the contacts and pressure sensor is not permissible.
- ◆ There must not be any foreign matter between the control unit and hydraulic unit.

Special tools and workshop equipment required

- ◆ Torque screwdriver - V.A.G 1624- 1-5 Nm Torx socket E6



- ◆ ESD (electrostatic discharge) workplace - VAS 6613-



## Procedure



### Caution

The ABS control unit - J104- and the ABS hydraulic unit - N55- must be removed before they are separated.

- Remove hydraulic unit [page 33](#).



### Note

To guard against electrostatic discharge, always use the ESD (electrostatic discharge) workplace - VAS 6613- to provide adequate earthing.

- Set down hydraulic unit with control unit on ESD workplace - VAS 6613- .
- The control unit -2- faces upwards; the hydraulic unit -4- with the pump motor and connector -3- face downwards.
- Remove and discard bolts -1-.
- Carefully lift off control unit vertically upwards.



### Note

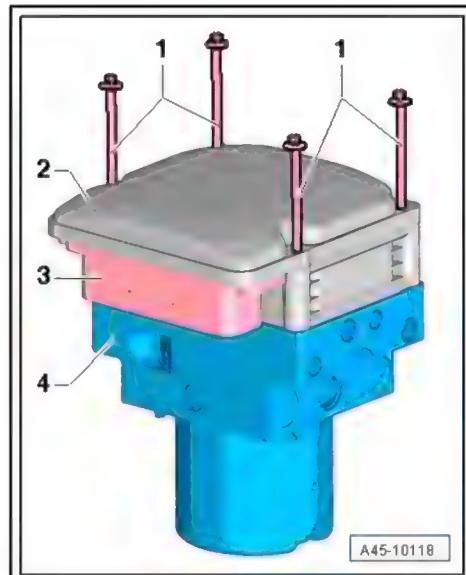
Make sure the valve coils do not catch; otherwise they can be distorted by the retainer.



### Caution

#### Risk of irreparable damage to hydraulic unit

- ◆ Cover the open hydraulic unit. Protect the hydraulic unit, sealing surfaces, valve body and pressure sensor against dirt and damage.
- ◆ Do not apply battery voltage to check the pump motor; this can cause scorching on the contacts.
- ◆ Protect the contact surfaces of the pressure sensor against mechanical damage and electrostatic discharge. Always use the ESD workplace - VAS 6613- to protect the components from overvoltage and ensure adequate earthing for the personnel.



## 3.4 Attaching control unit to hydraulic unit

### Procedure



### Note

Always renew bolts after removal.

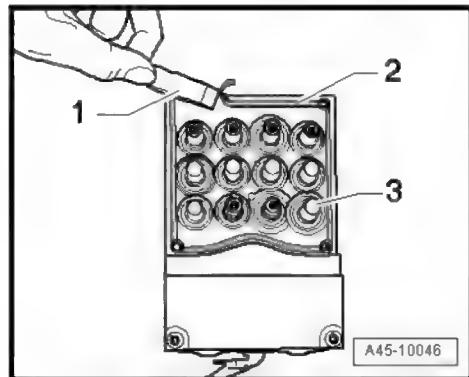
- Clean sealing surface on hydraulic unit -2- using plastic scraper -1-.
- The contact pins -3- must not be damaged or bent.



## Caution

### *Risk of malfunction*

- ◆ *The sealing surface on the hydraulic unit must be clean and smooth.*
- ◆ *The hydraulic unit must be renewed if the sealing surface or the contact lugs are damaged.*
- ◆ *The seal on the control unit cannot be replaced.*
- ◆ *The seal on the control unit must not be lifted or pulled out.*



## Note

- ◆ *Use the cleaning agent provided (do not use any aggressive cleaning products).*
- ◆ *Check sealing surface for damage (visual inspection).*



### **Caution**

### *Risk of irreparable damage to ABS control unit*

- ◆ *Make sure that no moisture or dirt gets inside the control unit.*
- ◆ *Do not blow out the control unit or hydraulic unit with compressed air.*
- ◆ *Take care to protect the control unit from knocks and impact; if it is dropped, the control unit must no longer be used.*

- Check contact pins in hydraulic unit for damage.



### **Caution**

### *Risk of malfunction*

- ◆ The hydraulic unit must not be re-used if the contact pins in the hydraulic unit are damaged or bent.



- The hydraulic unit -4- with the pump motor and connector -3- faces downwards.
- Carefully position control unit from above on hydraulic unit with valve coils hanging down.

 Note

*Take care to keep the valve coils straight.*

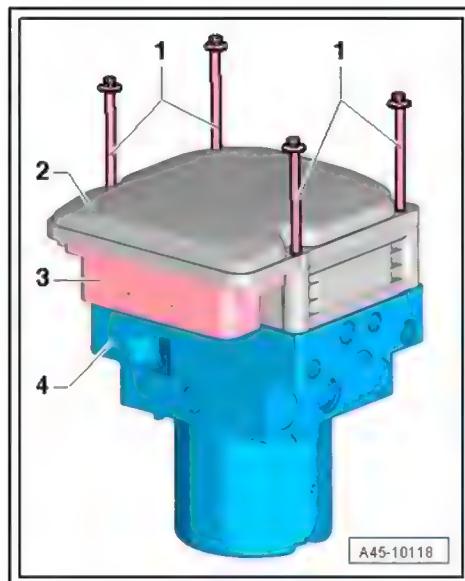
- Screw in (but do not tighten) the new bolts evenly until the control unit makes uniform contact with the hydraulic unit.
- Tighten bolts in diagonal sequence.

After screwing on, check:

- ◆ That all bolts make contact,
- ◆ That control unit and hydraulic unit make contact all-round.
- Install hydraulic unit [⇒ page 33](#).

After renewing the control unit and bleeding the brake system:

- Select “Replace” function for ABS control unit - J104- / ABS hydraulic unit - N55- ⇒ Vehicle diagnostic tester, [Guided Functions](#).
- All ESP warning lamps should go out.



**WARNING**

*Risk of accident!*

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

Tightening torques

- ◆ [⇒ “3.1 Exploded view - control unit and hydraulic unit”, page 31](#)



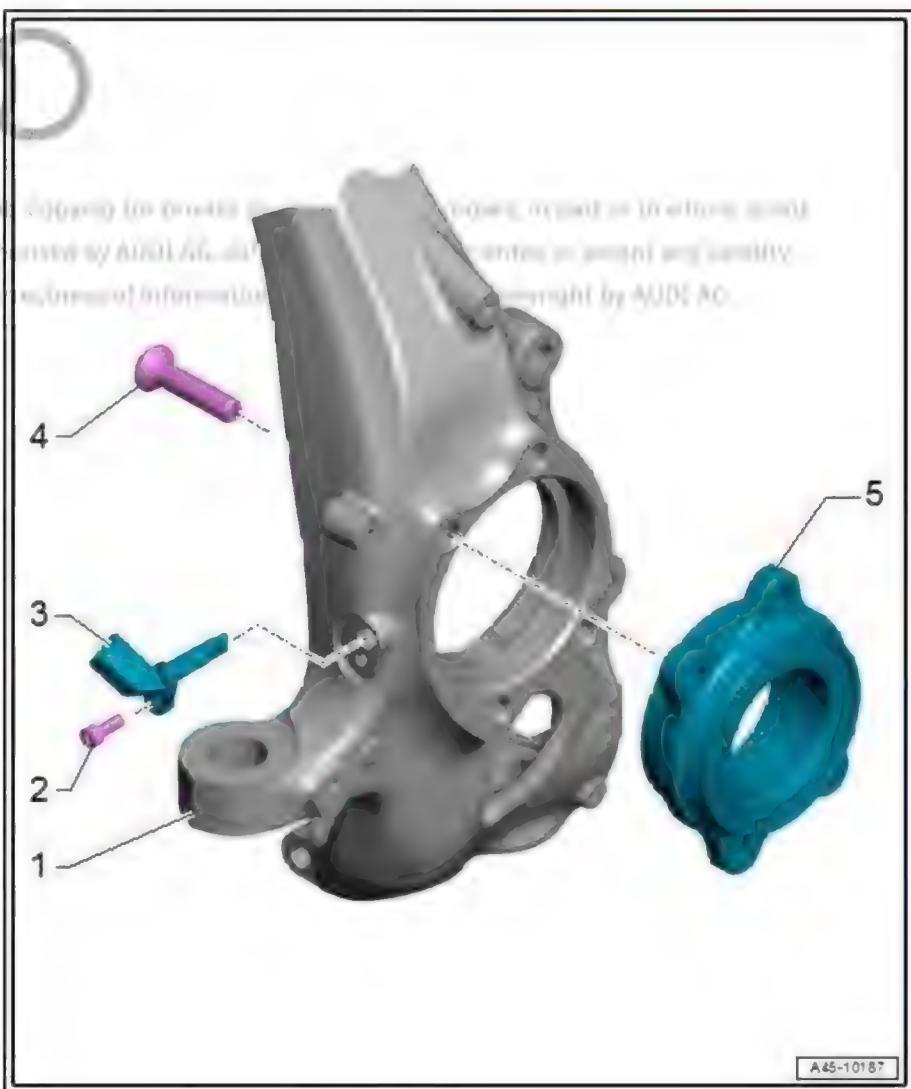
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## 4 Sensors

- ⇒ "4.1 Exploded view - front wheel speed sensor", page 49
- ⇒ "4.2 Exploded view - rear wheel speed sensor", page 50
- ⇒ "4.3 Removing and installing brake light switch", page 51
- ⇒ "4.4 Removing and installing brake pedal position sender", page 53
- ⇒ "4.5 Removing and installing control unit for sensor electronics", page 54
- ⇒ "4.6 Removing and installing front wheel speed sensor G45 / G47", page 55
- ⇒ "4.7 Removing and installing rear wheel speed sensor G44 / G46", page 56

### 4.1 Exploded view - front wheel speed sensor

- 1 - Wheel bearing housing
- 2 - Bolt
  - 9 Nm
- 3 - Speed sensor
  - Front right speed sensor - G45- / front left speed sensor - G47-
  - Removing and installing ⇒ page 55
- 4 - Bolt
  - Tightening torque ⇒ Running gear, axles, steering; Rep. gr. 40 ; Wheel bearing; Exploded view - wheel bearing
- 5 - Wheel bearing unit
  - ABS sensor ring is incorporated in wheel bearing unit



A45-10187

## 4.2 Exploded view - rear wheel speed sensor

⇒ "4.2.1 Exploded view - rear wheel speed sensor, vehicles with front-wheel drive", page 50

⇒ "4.2.2 Exploded view - rear wheel speed sensor, vehicles with four-wheel drive", page 51

### 4.2.1 Exploded view - rear wheel speed sensor, vehicles with front-wheel drive

1 - Wheel bearing housing

2 - Speed sensor

- Rear right speed sensor  
- G44- / rear left speed sensor - G46-
- Removing and installing  
⇒ [page 56](#)

3 - Bolt

- 9 Nm

4 - Additional seal

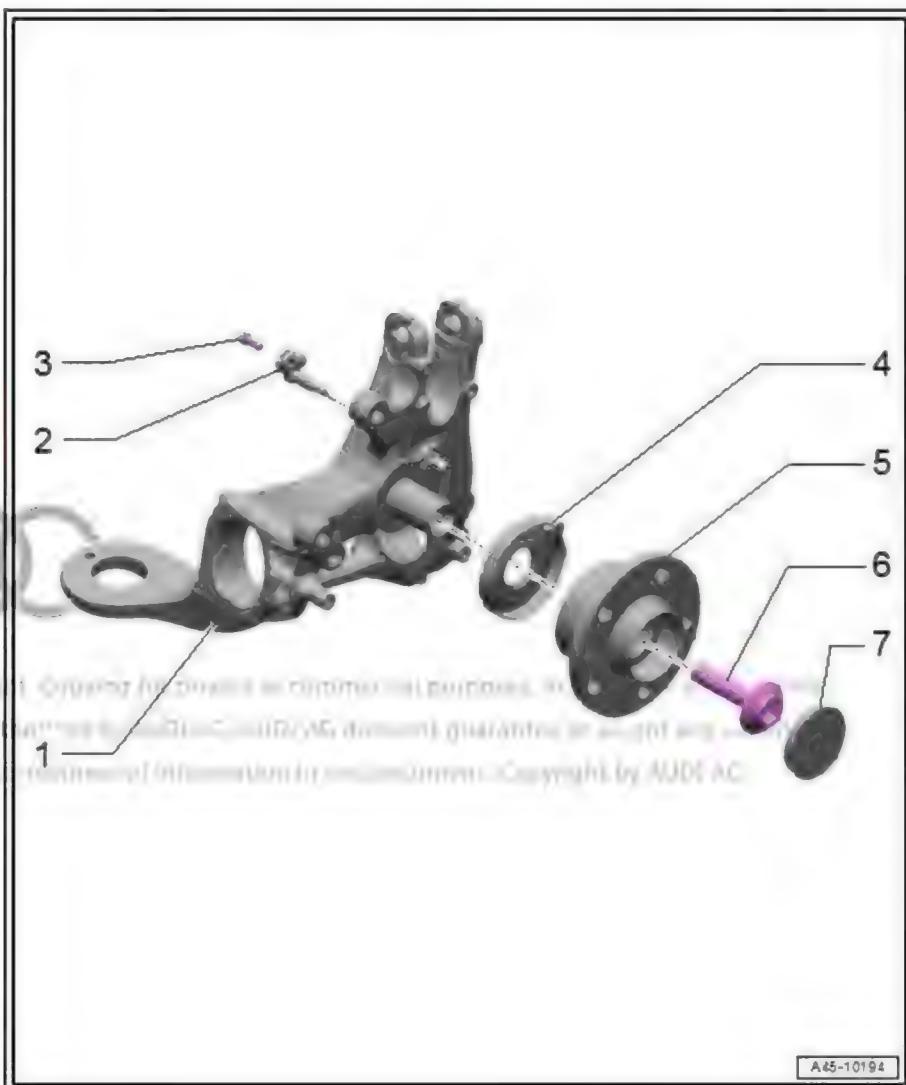
5 - Wheel bearing unit

- ABS sensor ring is incorporated in wheel bearing unit

6 - Bolt

- Tightening torque ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Exploded view ↗ wheel bearing

7 - Grease cap



#### 4.2.2 Exploded view - rear wheel speed sensor, vehicles with four-wheel drive

##### 1 - Wheel bearing unit

- ABS sensor ring is incorporated in wheel bearing unit

##### 2 - Wheel bearing housing

##### 3 - Bolt

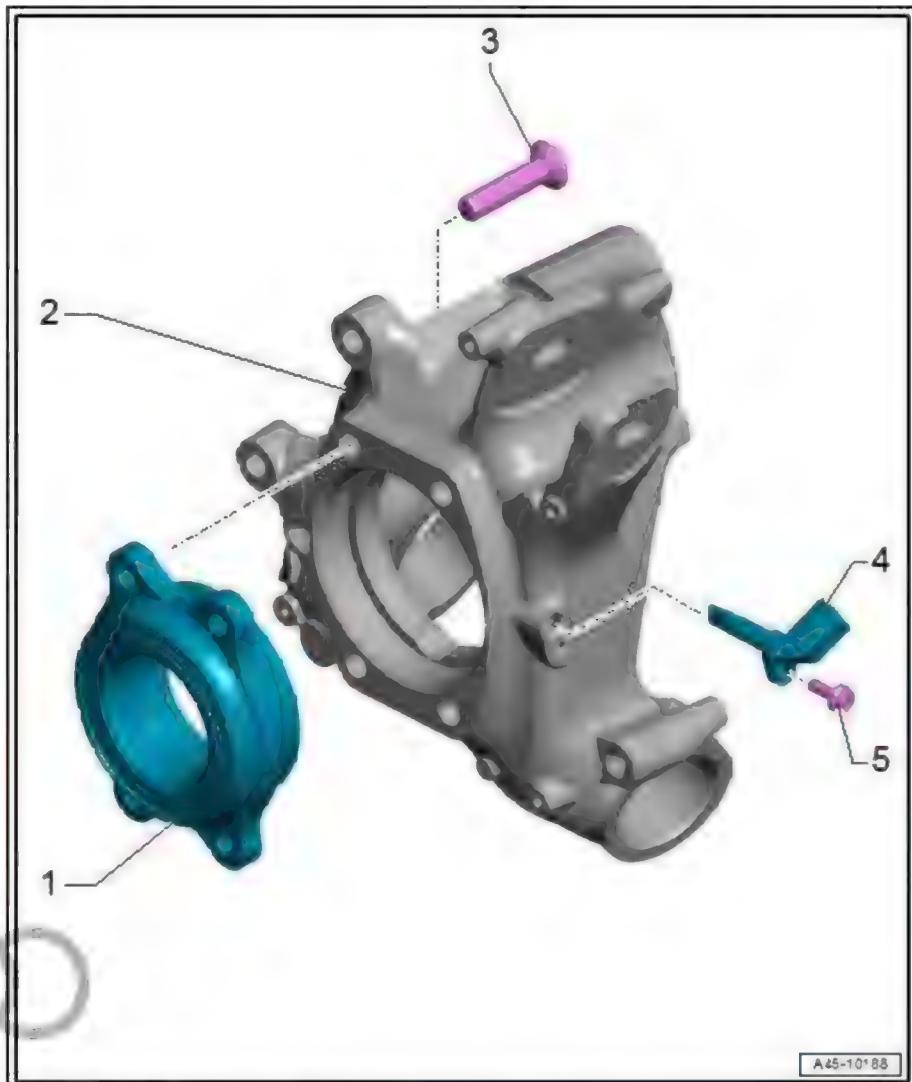
- Tightening torque → Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Exploded view - wheel bearing

##### 4 - Speed sensor

- Rear right speed sensor - G44- / rear left speed sensor - G46-
- Removing and installing [⇒ page 56](#)

##### 5 - Bolt

- 9 Nm



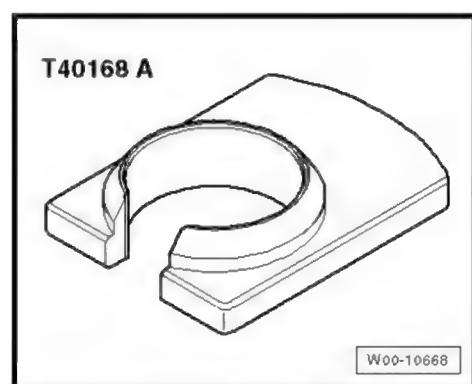
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#### 4.3 Removing and installing brake light switch

Fitting location: on brake pedal

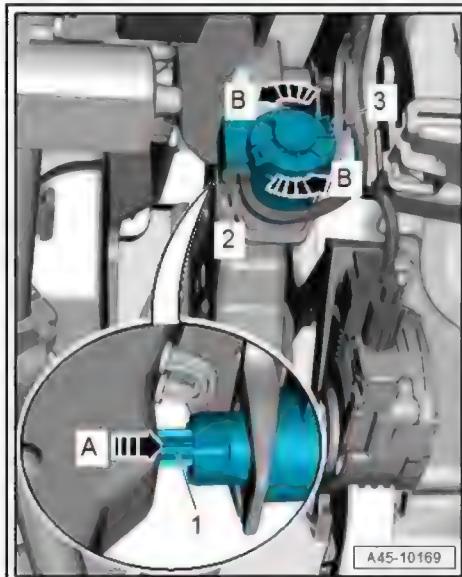
Special tools and workshop equipment required

- ◆ Release tool - T40168 A-



## Removing

- Remove footwell vent (driver side) ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side) .
- Unplug electrical connector -2- at brake light switch - F- .
- Press plunger -1- of brake light switch fully in with one finger -arrow A-.
- To release brake light switch, turn catch -3- fully anti-clockwise -arrows B- while keeping plunger pressed in.
- Let go of plunger when brake light switch is released.

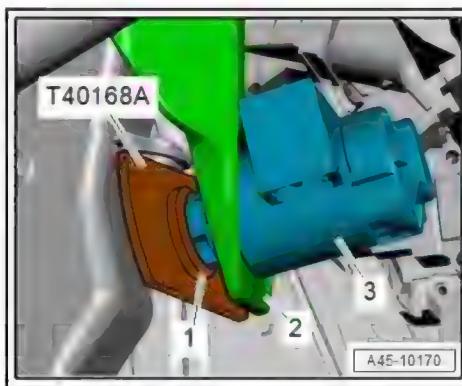


- Insert release tool - T40168 A- between brake pedal and plunger of brake light switch as shown in illustration.
- The tapered part -1-of the tool must face towards the driver's seat. The slot on the tool must correspond with the projection on the brake light switch.
- Press release tool - T40168 A- against brake light switch. This simultaneously releases the three retaining tabs on the brake light switch.
- Pull brake light switch - F- -item 3- out of mounting -2-.

## Installing

Installation is carried out in reverse order; note the following:

- The brake push rod must be attached to the brake pedal.
- Do not press the brake pedal while installing the switch.



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- Insert brake light switch - F- into mounting -1- on brake pedal.
- All three retaining tabs of the brake light switch - F- must engage audibly.
- The brake light switch - F- must not be turned in the mounting on the brake pedal.
- The plunger adjusts itself automatically when the switch is inserted.
- To lock brake light switch, turn catch -2- fully clockwise -arrows-.

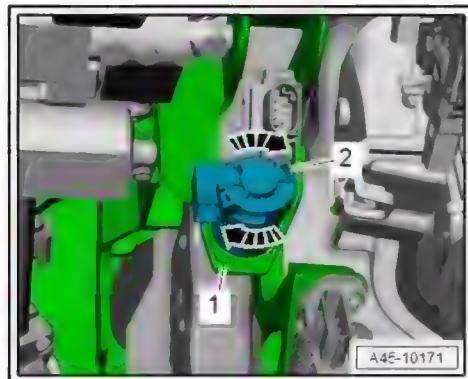
Remaining installation steps are the reverse of removal; note the following:

- Install footwell vent (driver side) ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side).



#### Note

*Make sure that the brake light switch works properly before the vehicle is driven on the road.*



## 4.4 Removing and installing brake pedal position sender



#### Note

*Vehicles with a high-voltage system are fitted additionally with a brake pedal position sender - G100- .*

### Removing

- Remove footwell vent (driver side) ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side) .
- Unplug electrical connector -1-.
- Remove bolts -arrows- and take out brake pedal position sender - G100- -item 2-.

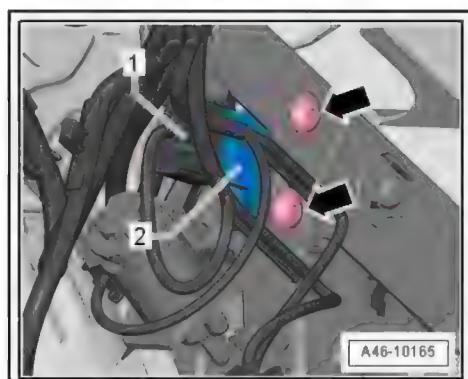
### Installing

Installation is carried out in reverse order; note the following:

- Install footwell vent (driver side) ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side) .

### Tightening torques

- ◆ ⇒ Fig. "" Brake pedal position sender -G100- - tightening torque"" , page 30



## 4.5 Removing and installing control unit for sensor electronics



Note

*When renewing control unit for sensor electronics - J849-, select "Replace" function for control unit for sensor electronics - J849- using → Vehicle diagnostic tester, Guided Functions.*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



### Removing

The control unit for sensor electronics - J849- is fitted beneath the cover for the centre console.

- Remove cover for centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .
- Unplug electrical connector -3-.
- Unfasten all four nuts -1-.
- Take out control unit for sensor electronics - J849- -2-.

### Installing

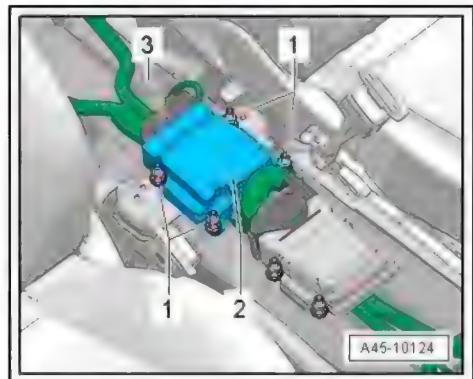
Installation is carried out in reverse order; note the following:



Caution

*Risk of irreparable damage to control unit for sensor electronics - J849-*

- ◆ *Take care to protect the control unit for sensor electronics - J849- from knocks and impact; if dropped, the control unit can no longer be used.*



- Locate control unit for sensor electronics - J849- on the four retaining pins.



Note

*Pay attention to correct installation position. The electrical connector faces in the direction of travel.*

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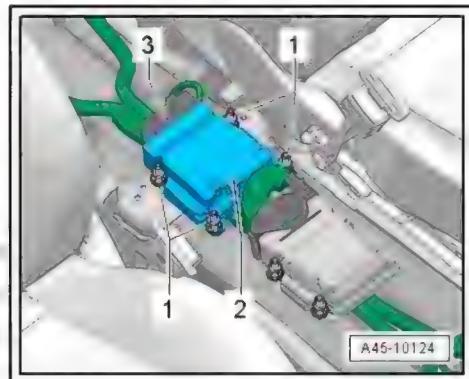
- Make sure the unit is seated in the mounting without strain.



Note

*To ensure strain-free installation of the control unit for sensor electronics - J849- -item 2-, first screw in all the nuts -1- lightly and then tighten in diagonal sequence.*

- Install cover for centre console ⇒ General body repairs, interior; Rep. gr. 68 ; Centre console; Exploded view - centre console .
- When renewing control unit for sensor electronics - J849- , select "Replace" function for control unit for sensor electronics - J849- using ⇒ Vehicle diagnostic tester, Guided Functions.



#### Tightening torques

- ◆ ⇒ Fig. "" Control unit for sensor electronics -J849- - tightening torque"" , page 30

## 4.6 Removing and installing front wheel speed sensor -G45- / -G47-



Note

*The sensor ring/rotor is incorporated in the corresponding wheel bearing unit and cannot be renewed.*

#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



- ◆ Lubricating paste - G 000 650-

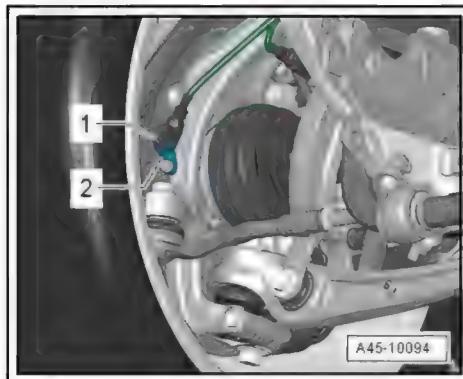
### Removing

- Release and unplug electrical connector at speed sensor -1-.
- Remove bolt -2-.
- Pull speed sensor out of wheel bearing housing.

### Installing

Installation is carried out in reverse order; note the following:

- Before inserting speed sensor, clean inner surface of fitting hole and coat speed sensor thoroughly with lubricating paste - G 000 650- .
- Fit and secure speed sensor.
- After installation, turn steering to full left and right lock and check clearance of speed sensor wire.



### Tightening torques

- ◆ [⇒ "4.1 Exploded view - front wheel speed sensor", page 49](#)

## 4.7 Removing and installing rear wheel speed sensor -G44- / -G46-

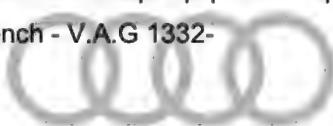


### Note

The sensor ring/rotor is incorporated in the corresponding wheel bearing unit and cannot be renewed.

### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

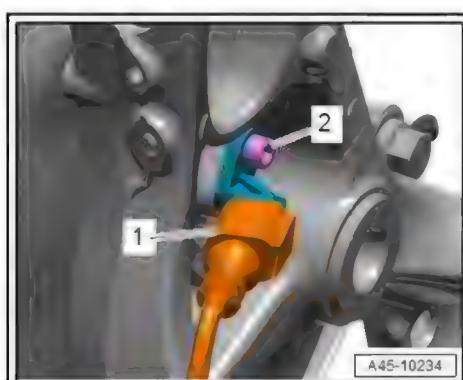


- ◆ Lubricating paste - G 000 650-

### Removing

#### Vehicles with front-wheel drive:

- Release and unplug electrical connector at speed sensor -1-.
- Remove bolt -2-.
- Pull speed sensor out of wheel bearing housing.



Four-wheel drive vehicles:

- Release and unplug electrical connector at speed sensor -1-.
- Remove bolt -2-.
- Pull speed sensor out of wheel bearing housing.

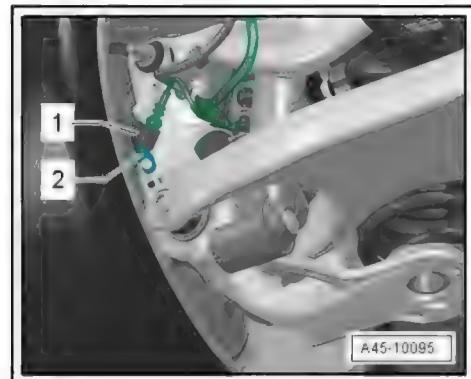
Installing

Installation is carried out in reverse order; note the following:

- Before inserting speed sensor, clean inner surface of fitting hole and coat speed sensor thoroughly with lubricating paste - G 000 650- .
- Fit and secure speed sensor.

Tightening torques

- ◆ ↳ “4.2 Exploded view ↳ rear wheel speed sensor”, page 50



## 5 Hold assist function

⇒ "5.1 Description of hold assist function", page 58

### 5.1 Description of hold assist function

Certain models are equipped with the Audi hold assist (auto hold) function.

#### Function

This function assists the driver when the vehicle has to be held stationary, either frequently or for long periods, with the engine running.

Once the vehicle has been stopped and the function is activated, the vehicle is held in position by the Audi hold assist.

The driver can then release the brake pedal.

Initially the vehicle is held at a standstill by maintaining the brake pressure at all four wheels in the ESP system.

To prevent the ESP solenoid valves from overheating if the vehicle has to be held for long periods, the braking function is taken over automatically by the electromechanical parking brake if the temperature at the solenoid valves exceeds 200 °C.

The brakes are released automatically at a point determined according to the following factors:

- ◆ Engine torque
- ◆ Angle of gradient
- ◆ Gear engaged
- ◆ Manual gearbox: travel at clutch pedal detected by clutch sensor
- ◆ Automatic gearbox: torque converter slip

To stop the vehicle rolling backwards, the brake is however not released until sufficient engine torque is available.

#### Activation

The following conditions must be satisfied to activate the "Stand-by" function:

- ◆ Driver's seat belt fastened
- ◆ Engine running
- ◆ Driver's door closed
- ◆ ESP and electromechanical parking brake functioning properly



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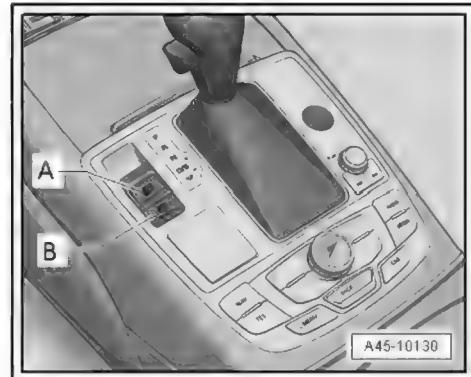
The function can then be activated by pressing the auto-hold button - E540- -B- in the centre console.

The switch indicates the operating status as follows:

- ◆ System deactivated: LED in switch OFF
- ◆ Standby: LED in switch ON
- ◆ System active: LED in switch lights up and a green "P" appears in the instrument cluster display

The electromechanical parking brake only takes over the braking function from the ESP when the green "P" appears in the instrument cluster display and when:

- ◆ The ESP solenoid valves reach a temperature of 200 °C,
- ◆ The driver's door is opened,
- ◆ The driver's seat belt is unfastened,
- ◆ The engine is switched off,
- ◆ The ignition is switched off,
- ◆ The brake pedal or accelerator pedal is pressed,
- ◆ The auto-hold button - E540- is pressed without pressing the foot brake.



 Note

*The green "P" in the instrument cluster changes to a "red P" when the electromechanical parking brake takes over the braking function from the ESP.*

## 46 – Brakes - mechanism

### 1 Front brakes

- ⇒ “1.1 Exploded view - front brakes”, page 60
- ⇒ “1.2 Removing and installing brake pads”, page 79
- ⇒ “1.3 Removing and installing brake caliper”, page 108
- ⇒ “1.4 Renewing brake caliper”, page 124
- ⇒ “1.5 Removing and installing brake disc”, page 138
- ⇒ “1.7 Removing and installing splash plate”, page 144

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⇒ “2 Rear brakes”, page 153

#### 1.1 Exploded view - front brakes

- ⇒ “1.1.1 Exploded view - front brakes, steel version (1LA/1LJ)”,  
page 60
- ⇒ “1.1.2 Exploded view - front brakes, steel version (1LF/1LL/  
1ZK/FM0)”, page 63
- ⇒ “1.1.3 Exploded view - front brakes (1LP)”, page 66
- ⇒ “1.1.6 Exploded view - front brakes, steel version (1LU)”, page  
70
- ⇒ “1.1.7 Exploded view - front brakes, steel version (1LM/1LX)”,  
page 74
- ⇒ “1.1.8 Exploded view - front brakes, ceramic version (1LN/  
1LW)”, page 77

##### 1.1.1 Exploded view - front brakes, steel version (1LA/1LJ)

**1 - Splash plate for brakes**

⇒ "1.7 Removing and installing splash plate", page 144

**2 - Hub carrier**

**3 - Bracket**

- For brake hose and electrical wiring

**4 - Bolt**

- 9 Nm

**5 - Bolt**

- With washer
- Bolt, 2x
- Renew after removing
- 196 Nm

**6 - Brake hose**

- Ensure correct routing: the brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point
- Renew if damaged
- Ensure that lugs are properly seated in grooves in bracket
- Tightening torque, brake hose to brake caliper: 20 Nm

**7 - Bracket**

- For brake hose

**8 - Retaining spring**

- Renew if damaged

**9 - Brake line**

- Tightening torque, brake line to brake hose: 16 Nm

**10 - Rivet**

- Bolt, 2x

**11 - Bolt**

- Bolt, 2x
- 30 Nm

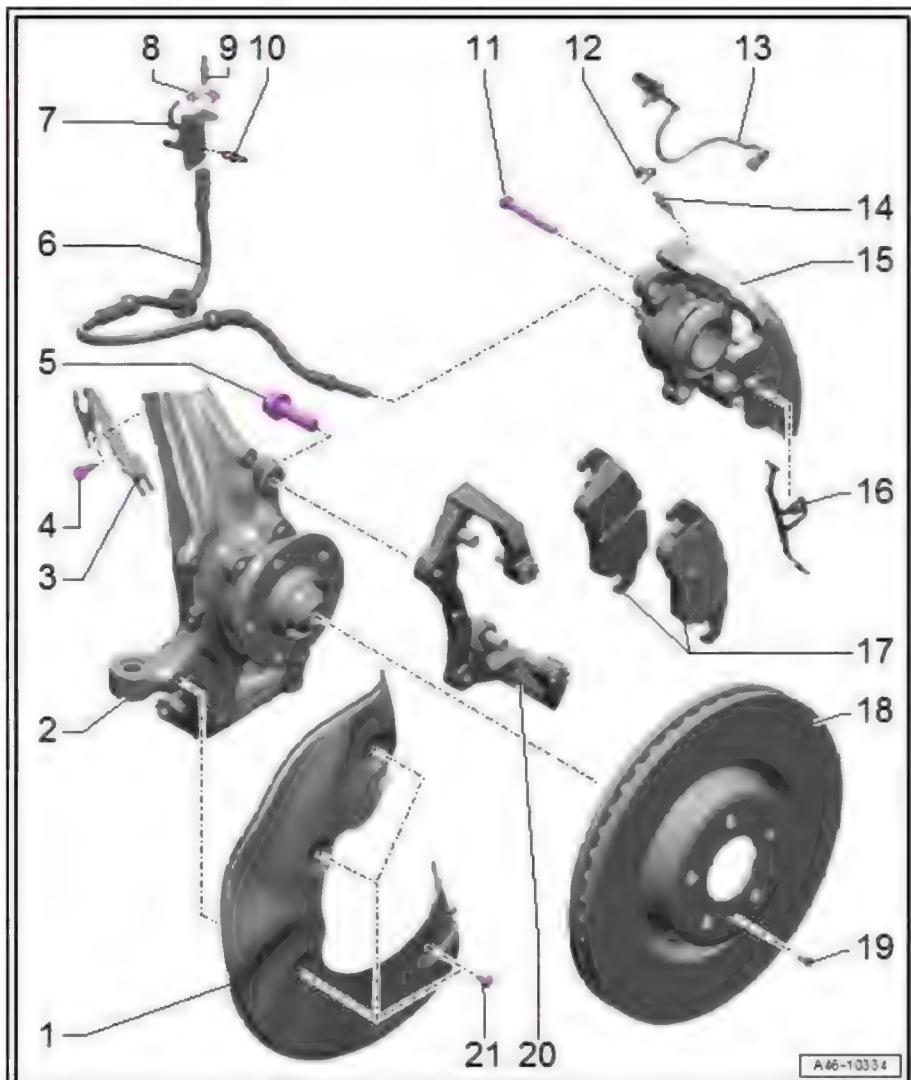
**12 - Dust cap**

**13 - Brake pad wear sender**

- Front left brake pad wear sender - G34- , front right brake pad wear sender - G35-
- For inner brake pad
- Renew if damaged
- ⇒ "1.8.1 Removing and installing pad wear indicator wire - steel version brakes (1LA / 1LJ)", page 145

**14 - Bleeder screw**

- ⇒ "6.2 Bleeding hydraulic system", page 273
- 13 Nm



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## 15 - Brake caliper

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Do not loosen bolts on brake caliper ⇒ [page 63](#)

⇒ "1.3 Removing and installing brake caliper", page 108

⇒ "1.4 Renewing brake caliper", page 124

- Servicing ⇒ [page 216](#)



### Note

- ◆ Depending on the model, two vibration dampers are fitted on each front brake caliper.
- ◆ ⇒ "1.1.4 Vibration dampers on brake caliper", page 68

## 16 - Damper spring

- Make sure that damper spring is seated correctly
- Tab of damper spring engages in brake caliper

## 17 - Brake pads

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Inner brake pad with pad wear sender
- Check pad thickness; wear limit ⇒ Maintenance ; Booklet 411
- Always renew on both sides of one axle

⇒ "1.2 Removing and installing brake pads", page 79

## 18 - Brake disc

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Wear limit ⇒ [page 6](#)

⇒ "1.5 Removing and installing brake disc", page 138

- Do not force brake disc off wheel hub. Use rust remover if necessary to avoid damaging brake disc



## 19 - Bolt

- 10 Nm

## 20 - Brake carrier

- Do not unfasten retaining pins ⇒ [page 63](#)
- Removing and installing brake caliper with brake carrier ⇒ [page 108](#)

## 21 - Bolt

- 4x
- 10 Nm



Note

*Coat brake pad backplate with lubricating paste, and coat guide pin[s] with lithium grease ⇒ Electronic parts catalogue "ETKA".*

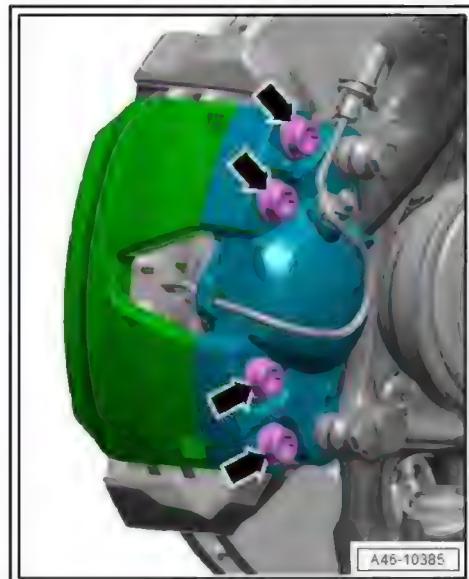
Do not loosen bolts on brake caliper.



Caution

*Risk of malfunction*

- ◆ *DO NOT slacken off bolts -arrows- on brake caliper.*



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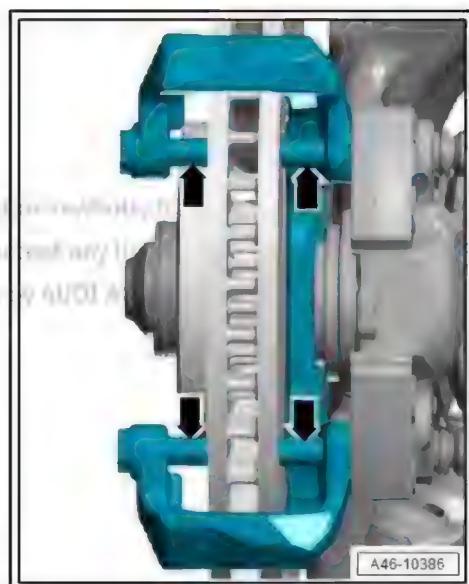
Do not unfasten retaining pins on brake carrier.



Caution

*Risk of malfunction*

- ◆ *DO NOT unfasten retaining pins -arrows- on brake carrier.*



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### 1.1.2 Exploded view - front brakes, steel version (1LF/1LL/1ZK/FM0)

1 - Splash plate for brakes

⇒ "1.7 Removing and installing splash plate", page 144

2 - Hub carrier

3 - Bracket

- For brake hose and electrical wiring

4 - Bolt

- 9 Nm

5 - Bolt

- With washer
- Bolt, 2x
- Renew after removing
- 196 Nm

6 - Brake hose

- Ensure correct routing: the brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point
- Renew if damaged
- Ensure that lugs are properly seated in grooves in bracket
- Tightening torque, brake hose to brake caliper: 20 Nm

7 - Bracket

- For brake hose

8 - Retaining spring

- Renew if damaged

9 - Brake line

- Tightening torque, brake line to brake hose: 16 Nm

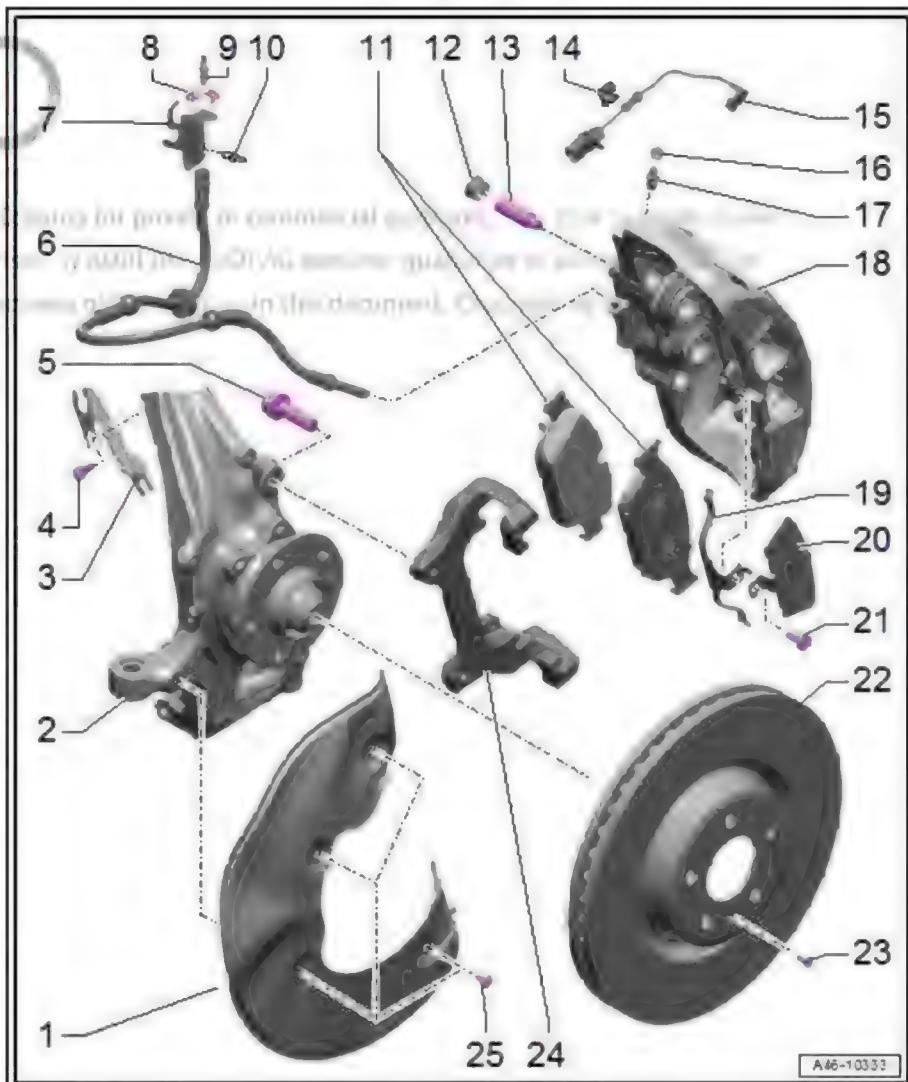
10 - Rivet

- Bolt, 2x

11 - Brake pads

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Inner brake pad with pad wear sender
- Check pad thickness; wear limit ⇒ Maintenance ; Booklet 411
- Always renew on both sides of one axle

⇒ "1.2 Removing and installing brake pads", page 79



12 - Protective cap

13 - Guide pin

- Seal off with protective cap
- 55 Nm

14 - Clip

15 - Brake pad wear sender

- Front left brake pad wear sender - G34- , front right brake pad wear sender - G35-

- For inner brake pad
- Renew if damaged
- ⇒ [“1.8.2 Removing and installing pad wear indicator wire - steel version brakes \(1LF / 1LL\)”, page 146](#)

16 - Dust cap

17 - Bleeder screw

- ⇒ [“6.2 Bleeding hydraulic system”, page 273](#)
- 13 Nm

18 - Brake caliper

- For correct version refer to ⇒ Electronic parts catalogue “ETKA”
- ⇒ [“1.3 Removing and installing brake caliper”, page 108](#)
- ⇒ [“1.4 Renewing brake caliper”, page 124](#)
- Servicing ⇒ [page 219](#)



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- ◆ Depending on the model, two vibration dampers are fitted on each front brake caliper.
- ◆ ⇒ [“1.1.4 Vibration dampers on brake caliper”, page 68](#)

19 - Damper spring

- Make sure that trim and damper spring are installed in correct position
- Tab of damper spring engages in brake caliper
- Tab of damper spring is positioned beneath trim

20 - Trim

- Make sure that trim and damper spring are installed in correct position
- Tab of damper spring engages in brake caliper
- Tab of damper spring is positioned beneath trim

21 - Bolt

- 22 Nm

22 - Brake disc

- For correct version refer to ⇒ Electronic parts catalogue “ETKA”
- Wear limit ⇒ [page 6](#)
- ⇒ [“1.5 Removing and installing brake disc”, page 138](#)
- Do not force brake disc off wheel hub. Use rust remover if necessary to avoid damaging brake disc



23 - Bolt

- 10 Nm

24 - Brake carrier

- Bolt to wheel bearing housing
- Removing and installing brake caliper with brake carrier ⇒ [page 110](#)

25 - Bolt

- 4x
- 10 Nm



Note

*Coat brake pad backplate with lubricating paste, and coat guide pin[s] with lithium grease ⇒ Electronic parts catalogue "ETKA".*

### 1.1.3 Exploded view - front brakes (1LP)

1 - Bolt



Note

*Only loosen these bolts to remove the brake caliper*

- 196 Nm

2 - Brake caliper

- Do not loosen any bolts on the brake caliper.

⇒ "1.3 Removing and installing brake caliper", page 108

⇒ "1.4 Renewing brake caliper", page 124



Note

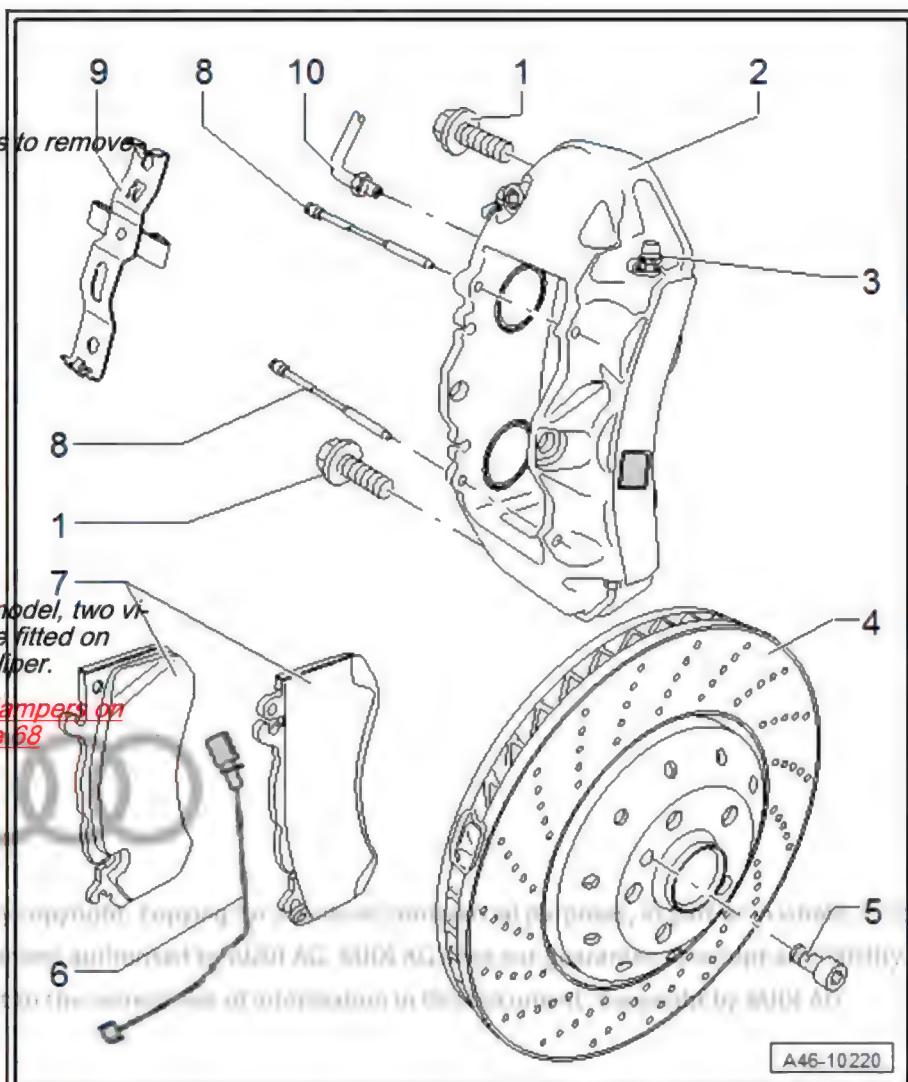
- ◆ Depending on the model, two vibration dampers are fitted on each front brake caliper.
- ◆ ⇒ "1.1.4 Vibration dampers on brake caliper", page 68

3 - Bleeder screw

- 13 Nm

4 - Brake disc

- For correct version refer to ⇒ Electronic parts catalogue
- Wear limit
- ⇒ "1.5 Removing and installing brake disc", page 138
- ⇒ "1.6 Renew brake disc", page 142
- Clean and grease contact surfaces between wheel hub and brake disc. ⇒ Electronic parts catalogue.





**WARNING**

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

**5 - Bolt**

- Brake disc to wheel hub
- 10 Nm

**6 - Pad wear indicator wire**

- On inner pad

**7 - Brake pads**

- With pad wear indicator wire on inner brake pad
- Checking pad thickness ⇒ Maintenance ; Booklet
- Wear limit ⇒ Maintenance ; Booklet
- Before fitting pads, clean guide surfaces and apply a thin coating of grease. For grease, refer to ⇒ Electronic parts catalogue
- Ensure correct installation position

⇒ "1.2 Removing and installing brake pads", page 79

**8 - Pad retaining pins**

- Ensure correct installation position
- Press through as far as possible from inside to outside

**9 - Pad retaining spring**

- Ensure correct installation position

**10 - Brake line**



**Note**

*Do not loosen when changing brake pads*

- 19 Nm



**Note**

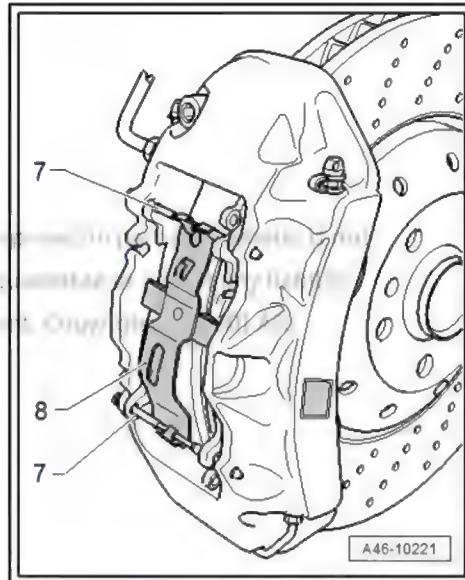
*Coat brake pad backplate with lubricating paste, and coat guide pin[s] with lithium grease ⇒ Electronic parts catalogue "ETKA".*

⇒ "1.7 Removing and installing splash plate", page 144

Installation position of pad retaining spring: pad retaining pin -7-,  
pad retaining spring -8-



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### 1.1.4 Vibration dampers on brake caliper

Depending on the model, two vibration dampers are fitted on each front brake caliper.

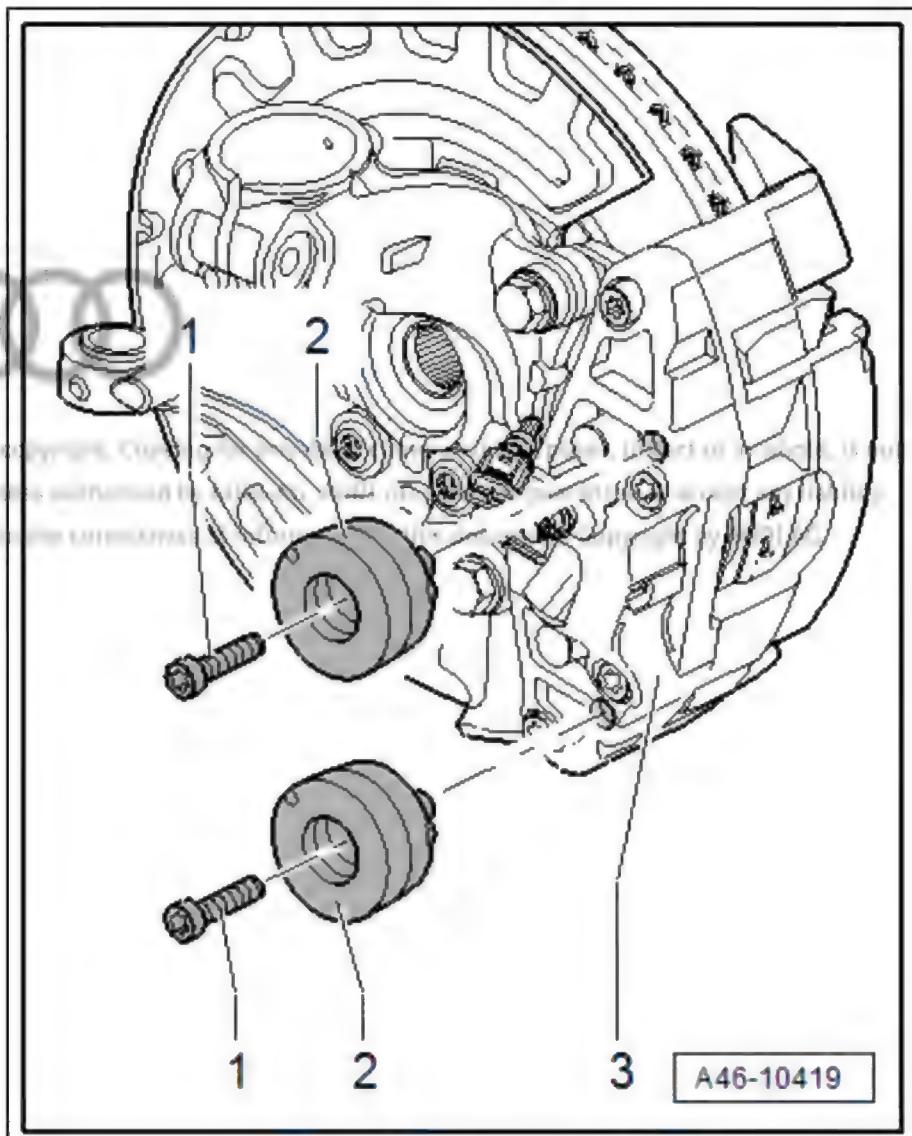
**1 - Bolt**

- Always renew if removed
- 10 Nm

**2 - Vibration damper**

- Two fitted on each front brake caliper
- 

**3 - Brake caliper**



### 1.1.5 Removing and installing vibration dampers

Depending on the model, two vibration dampers are fitted on each front brake caliper.

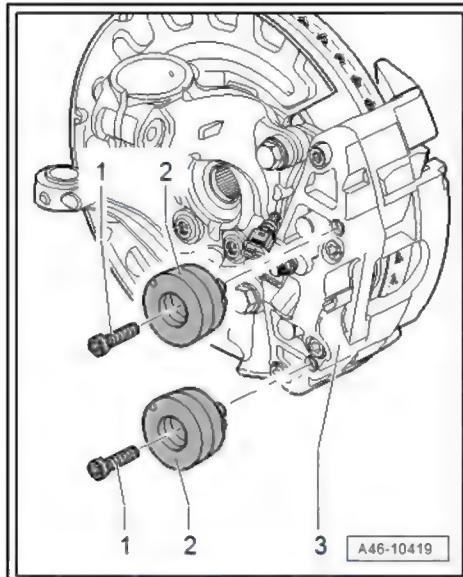
#### Removing

- Remove dust cap if fitted.

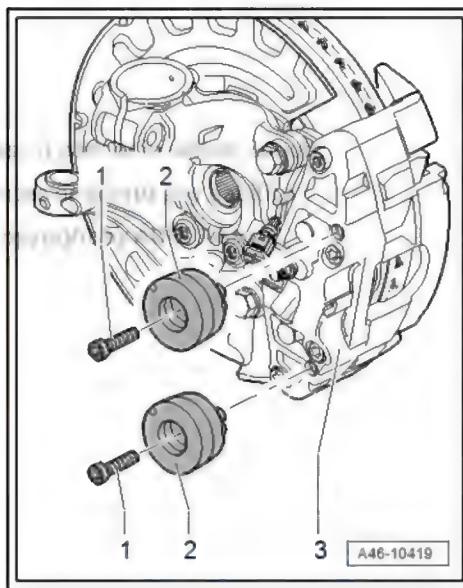
- Remove bolt -1-.
- Remove vibration damper -2- from brake caliper -3-.

Installing

- Clean brake caliper in area of vibration damper.



- Fit vibration damper -2- in brake caliper.
- Insert new bolts -1- and tighten bolts [⇒ Item 1 \(page 69\)](#).
- Install protective cap if originally fitted.



### 1.1.6 Exploded view - front brakes, steel version (1LU)

**1 - Splash plate for brakes**

⇒ "1.7 Removing and installing splash plate", page 144

**2 - Hub carrier**

**3 - Bracket**

- For brake hose and electrical wiring

**4 - Bolt**

- 9 Nm

**5 - Bolt**

- With washer
- Bolt, 2x
- Renew after removing
- 196 Nm

**6 - Brake hose**

- Ensure correct routing: the brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point
- Renew if damaged
- Ensure that lugs are properly seated in grooves in bracket
- Tightening torque, brake hose to brake caliper: 20 Nm

**7 - Bracket**

- For brake hose

**8 - Retaining spring**

- Renew if damaged

**9 - Brake line**

- Tightening torque, brake line to brake hose: 16 Nm

Warning: When changing the assembly, ensure that the retaining spring is held firmly in the assembly.

- Bolt, 2x**

**11 - Brake pads**

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Inner brake pad with pad wear sender
- Check pad thickness; wear limit ⇒ Maintenance ; Booklet 411
- Always renew on both sides of one axle

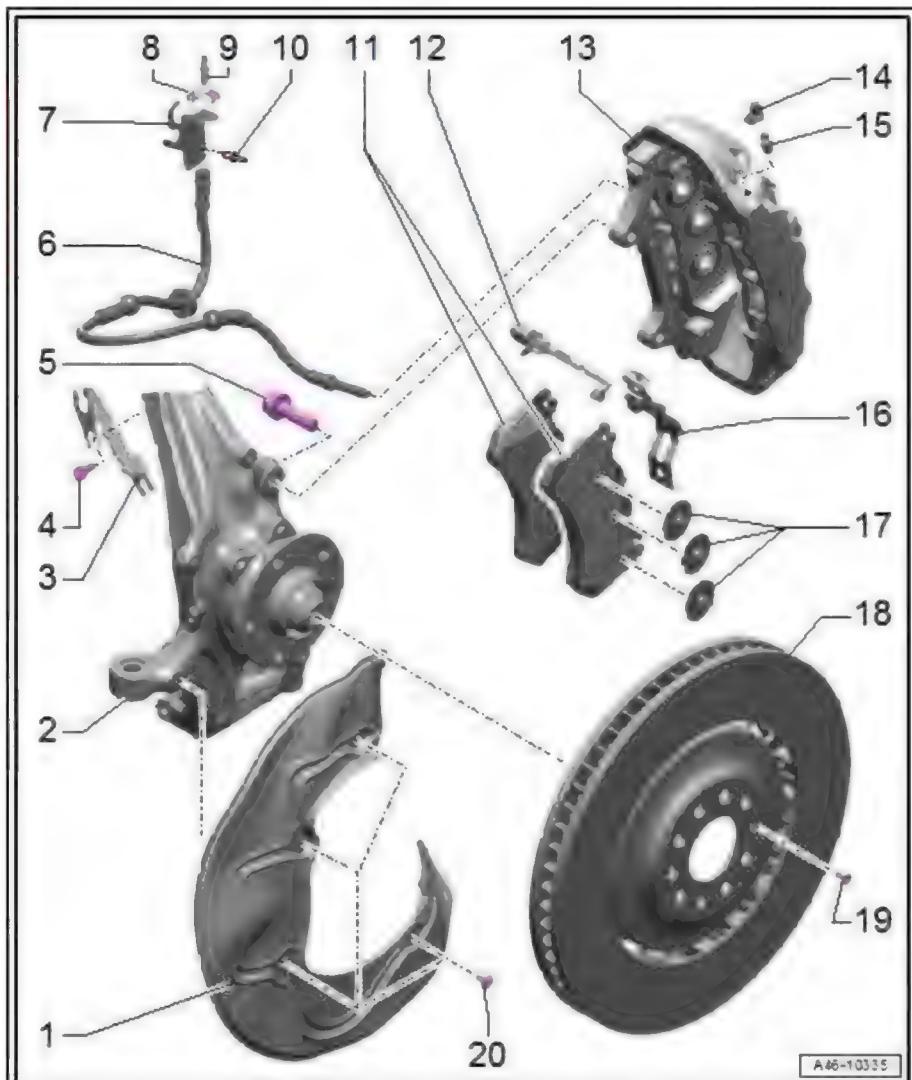
⇒ "1.2 Removing and installing brake pads", page 79

**12 - Brake pad wear sender**

- Front left brake pad wear sender - G34- , front right brake pad wear sender - G35-
- For inner brake pad
- Renew if damaged
- Removing and installing ⇒ page 148

**13 - Brake caliper**

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"



- Do not loosen bolts on brake caliper [⇒ page 73](#)
- ⇒ “1.3 Removing and installing brake caliper”, page 108
- ⇒ “1.4 Renewing brake caliper”, page 124

Servicing [⇒ page 223](#)



Note

- ◆ *Depending on the model, two vibration dampers are fitted on each front brake caliper.*
- ◆ [⇒ “1.1.4 Vibration dampers on brake caliper”, page 68](#)

14 - Dust cap

15 - Bleeder screw

- [⇒ “6.2 Bleeding hydraulic system”, page 273](#)
- 13 Nm

16 - Pad retaining spring

- Note installation position [⇒ page 73](#).
- Renew when changing pads
- Ensure correct positioning in brake caliper

17 - Spring plate

- With adhesive pad
- 6x
- Insert in brake caliper pistons before fitting outer brake pads



Note

- ◆ *Use new spring plates when installing new brake pads. Insert spring plates into brake pistons before fitting brake pads.*
- ◆ *If the old brake pads are being reinstalled, fit the brake pads with the bonded spring plates into the brake caliper.*

18 - Brake disc

- For correct version refer to ⇒ Electronic parts catalogue “ETKA”
- Wear limit [⇒ page 6](#)

⇒ “1.5 Removing and installing brake disc”, page 138

- Do not force brake disc off wheel hub. Use rust remover if necessary to avoid damaging brake disc



19 - Bolt

- 10 Nm

20 - Bolt

- 4x
- 10 Nm



Note

*Coat brake pad backplate with lubricating paste, and coat guide pin[s] with lithium grease ⇒ Electronic parts catalogue "ETKA".*

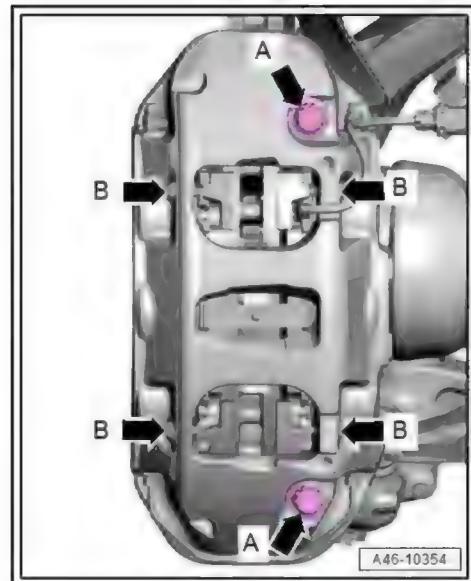
Do not loosen bolts on brake caliper.



Caution

*Risk of malfunction*

- ◆ *DO NOT slacken off bolts -arrows A- on brake caliper.*
- ◆ *Do not unscrew guide pins -arrows B-.*



Note

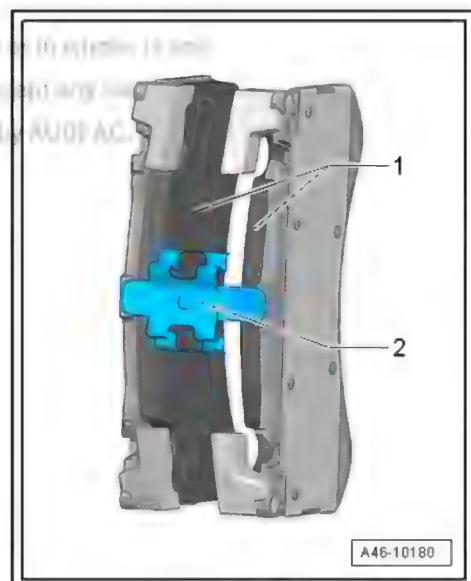
*Only renew guide pins -arrows B- on ceramic brakes.*

Installation position of pad retaining spring



Note

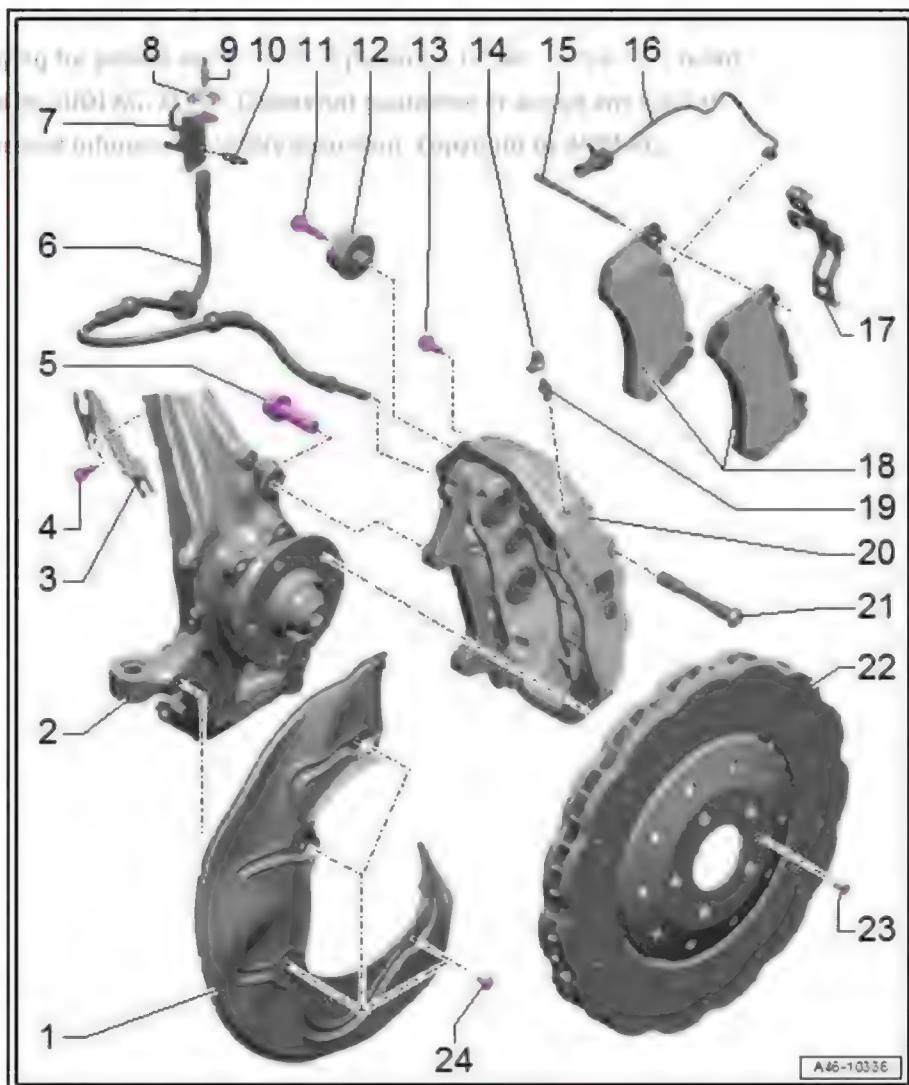
*Make sure the pad retaining spring -2- is correctly positioned between brake pads -1-.*



### 1.1.7 Exploded view - front brakes, steel version (1LM/1LX)



- 1 - Splash plate for brakes  
⇒ **"1.7 Removing and installing splash plate"**, page 144
- 2 - Hub carrier
- 3 - Bracket
- For brake hose and electrical wiring
- 4 - Bolt
- 9 Nm
- 5 - Bolt
  - With washer
  - Bolt, 2x
  - Renew after removing
  - 196 Nm
- 6 - Brake hose
  - Make sure the brake hose is routed correctly. The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
  - Renew if damaged
  - Ensure that lugs are properly seated in grooves in bracket
  - Tightening torque, brake hose to brake caliper: 20 Nm
- 7 - Bracket
  - For brake hose
- 8 - Retaining spring
  - Renew if damaged
- 9 - Brake line
  - Tightening torque, brake line: 20 Nm
- 10 - Rivet
  - Bolt, 2x
- 11 - Bolt
  - 4x
  - 9 Nm
- 12 - Damper weight
  - Bolt, 2x
- 13 - Bolt
  - For centre retaining pin
  - Renew after removing
  - 30 Nm



14 - Protective cap

15 - Pad retaining pin

- Bolt, 2x
- Renew when changing pads
- Note correct installation position
- Knock out inwards

16 - Brake pad wear sender

- Front left brake pad wear sender - G34- / front right brake pad wear sender - G35-
- For inner brake pad
- Renew if damaged
- Cannot be removed without damage
- Removing and installing ⇒ [page 149](#)

17 - Pad retaining spring

- Note installation position ⇒ [page 76](#).
- Renew when changing pads
- Ensure correct positioning in brake caliper

18 - Brake pads

- Check pad thickness; wear limit ⇒ Maintenance ; Booklet 411
- Always renew on both sides of one axle
- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Note correct position: inner brake pad with retainer for pad wear sender

⇒ ["1.2 Removing and installing brake pads", page 79](#)

19 - Bleeder screw

- 10 Nm



20 - Brake caliper

- Must not be unbolted from brake carrier ⇒ [page 76](#)
- For correct version refer to ⇒ Electronic parts catalogue "ETKA"

⇒ ["1.3 Removing and installing brake caliper", page 108](#)

⇒ ["1.4 Renewing brake caliper", page 124](#)

- Servicing ⇒ [page 223](#)



Note

- ◆ *Depending on the model, two vibration dampers are fitted on each front brake caliper.*
- ◆ ⇒ ["1.1.4 Vibration dampers on brake caliper", page 68](#)

21 - Retaining pin

- Renew when changing pads

22 - Brake disc

- Wear limit ⇒ [page 6](#)
- For correct version refer to ⇒ Electronic parts catalogue "ETKA"

⇒ ["1.5 Removing and installing brake disc", page 138](#)



**WARNING**

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

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**23 - Bolt**

- 4x
- 10 Nm

**24 - Bolt**

- 4x
- 10 Nm



**Note**

Coat brake pad backplate with lubricating paste, and coat guide pin[s] with lithium grease ⇒ Electronic parts catalogue "ETKA".

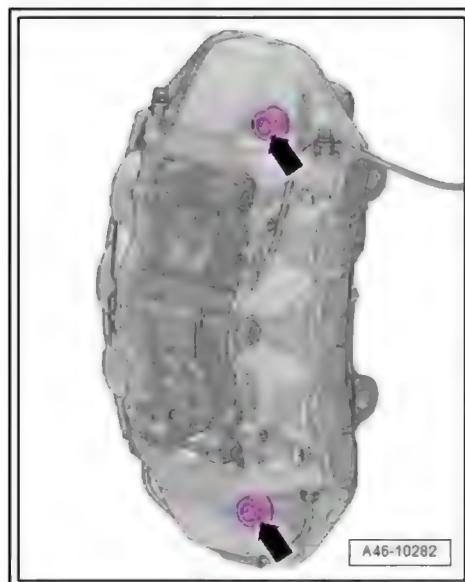
Do not loosen bolts securing brake caliper to brake carrier



**Caution**

*Risk of malfunction*

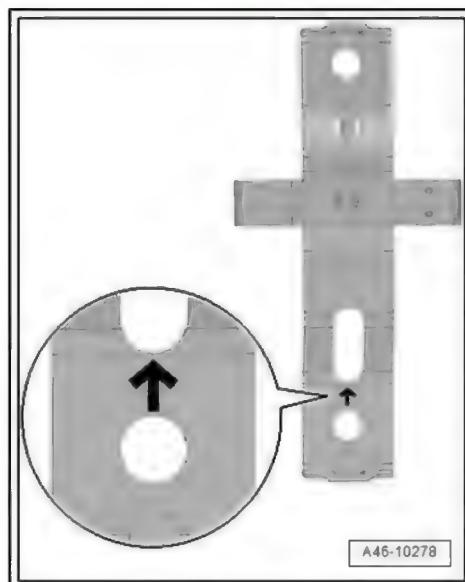
- ◆ *DO NOT slacken off bolts -arrows- on brake caliper.*



A46-10282

Installation position of pad retaining spring

- Arrow points in direction of forward wheel rotation.



A46-10278

### 1.1.8 Exploded view - front brakes, ceramic version (1LN/1LW)

1 - Splash plate for brakes  
 ⇒ "1.7 Removing and installing splash plate", page 144

2 - Hub carrier

3 - Bracket

- For brake hose and electrical wiring

4 - Bolt

- 9 Nm

5 - Bolt

- With washer
- Bolt, 2x
- Renew after removing
- 196 Nm

6 - Brake hose

- Make sure the brake hose is routed correctly. The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- Renew if damaged
- Ensure that lugs are properly seated in grooves in bracket
- Tightening torque, brake hose to brake caliper: 20 Nm

7 - Bracket

- For brake hose

8 - Retaining spring

- Renew if damaged

9 - Brake line

- Tightening torque, brake line to brake hose: 14 Nm

10 - Rivet

- Bolt, 2x

11 - Bolt

- 4x
- 9 Nm

12 - Damper weight

- Bolt, 2x

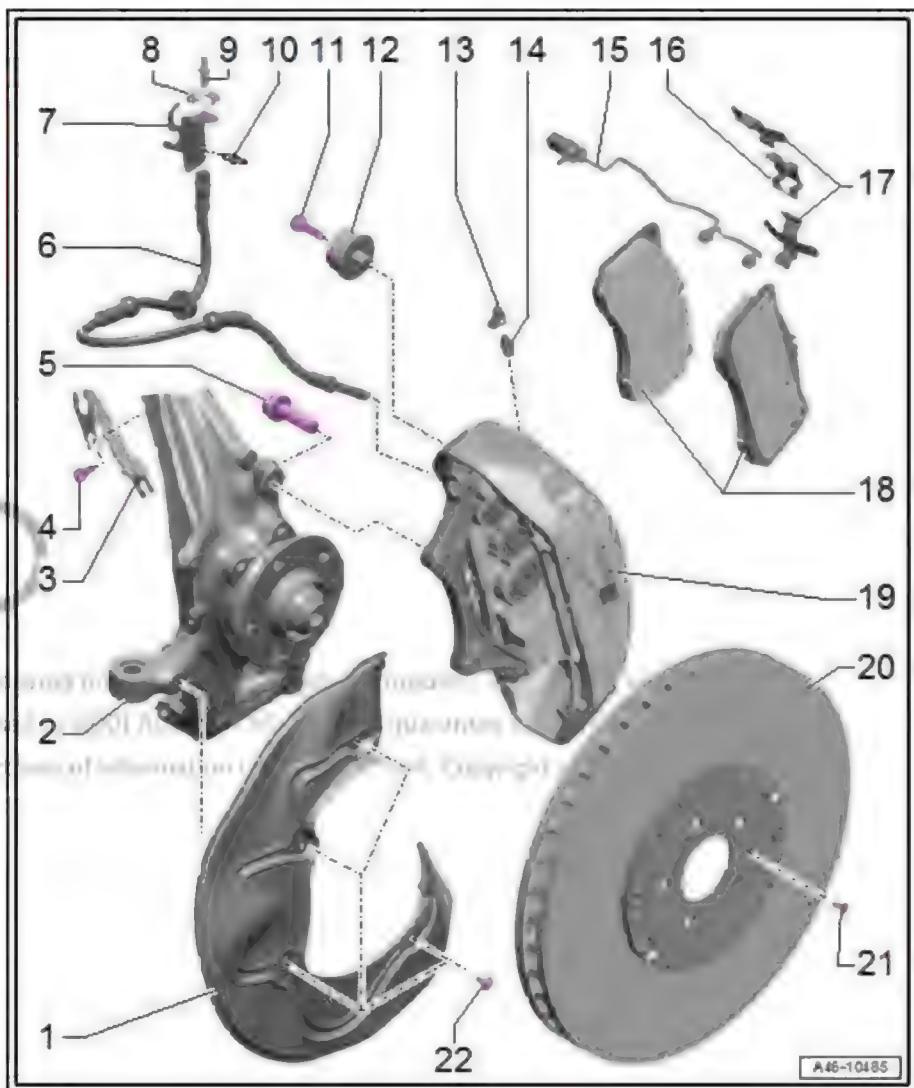
13 - Protective cap

14 - Bleeder screw

- 10 Nm

15 - Brake pad wear sender

- Front left brake pad wear sender - G34- / front right brake pad wear sender - G35-



- Renew if damaged
- Cannot be removed without damage
- Removing and installing [⇒ page 150](#)

#### 16 - Bracket

- For electrical wire for pad wear sender
- Renew if damaged
- Ensure correct positioning in brake caliper

#### 17 - Pad retaining springs

- Note correct installation position
- Renew when changing pads
- Ensure correct positioning in brake caliper

#### 18 - Brake pads

- Check pad thickness; wear limit [⇒ Maintenance ; Booklet 411](#)
- Always renew on both sides of one axle
- For correct version refer to [⇒ Electronic parts catalogue "ETKA"](#)
- Note correct installation position

[⇒ "1.2 Removing and installing brake pads", page 79](#)

#### 19 - Brake caliper

- Must not be unbolted from brake carrier [⇒ page 79](#)
- Tighten guide pins for brake pads to 24 Nm [⇒ page 79](#)
- For correct version refer to [⇒ Electronic parts catalogue "ETKA"](#)

[⇒ "1.3 Removing and installing brake caliper", page 108](#)

[⇒ "1.4 Renewing brake caliper", page 124](#)

- Servicing [⇒ page 223](#)



##### Note

- ◆ *Depending on the model, two vibration dampers are fitted on each front brake caliper.*
- ◆ [⇒ "1.1.4 Vibration dampers on brake caliper", page 68](#)

#### 20 - Brake disc

- For correct version refer to [⇒ Electronic parts catalogue "ETKA"](#)
- Assessing degree of wear [⇒ page 14](#)
- Also check for:
  - ◆ Cracks in the bolted joint area [⇒ page 12](#)
  - ◆ Edge fractures [⇒ page 13](#)
  - ◆ Chipping [⇒ page 13](#)
  - ◆ Cracks extending into cooling channels [⇒ page 14](#)
    - Note direction of rotation

[⇒ "1.5 Removing and installing brake disc", page 138](#)



#### WARNING

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

#### 21 - Bolt

- 10 Nm

#### 22 - Bolt

- 4x
- 10 Nm



#### Note

Coat brake pad backplate with lubricating paste, and coat guide pin[s] with lithium grease ⇒ Electronic parts catalogue "ETKA".

DO NOT slacken off bolts -arrow A- on brake caliper.

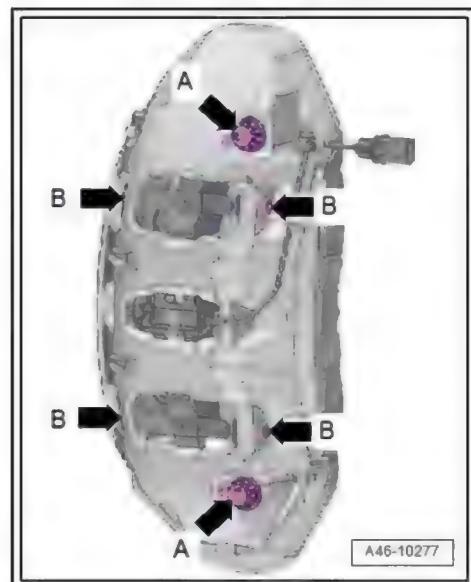


#### Caution

##### Risk of malfunction

- ◆ DO NOT slacken off bolts -arrows A- on brake caliper.
- ◆ Renew guide pins -arrows B- after removal.

Tighten guide pins -B- to 24 Nm.



A46-10277

## 1.2 Removing and installing brake pads

⇒ "1.2.1 Removing and installing brake pads - steel version brakes (1LA/1LJ)", page 79

⇒ "1.2.2 Removing and installing brake pads - steel version brakes (1LF/1LL)", page 84

⇒ "1.2.3 Removing and installing brake pads (1LP)", page 89

⇒ "1.2.4 Removing and installing brake pads - steel version brakes (1LU)", page 93

⇒ "1.2.5 Removing and installing brake pads - steel version brakes (1LM/1LX)", page 97

⇒ "1.2.6 Removing and installing brake pads - ceramic brakes (1LN/1LW)", page 103

### 1.2.1 Removing and installing brake pads - steel version brakes (1LA/1LJ)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Piston resetting appliance - T10145-



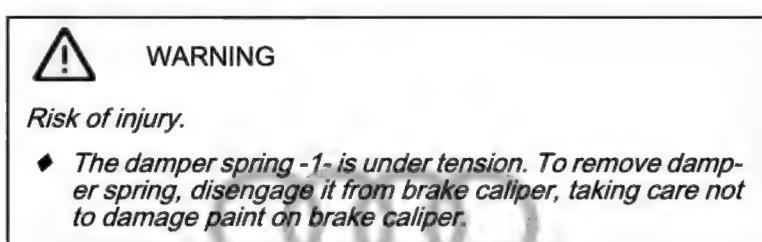
## Removing



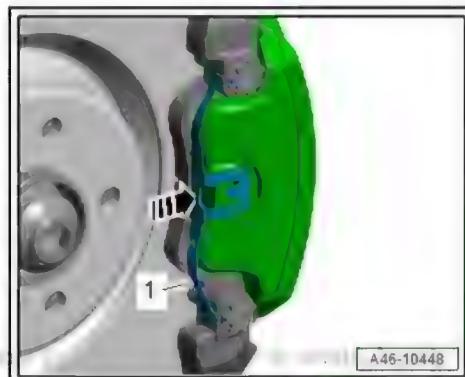
Note

*Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.*

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



- Press damper spring -1- in direction of -arrow- and disengage it from brake caliper.

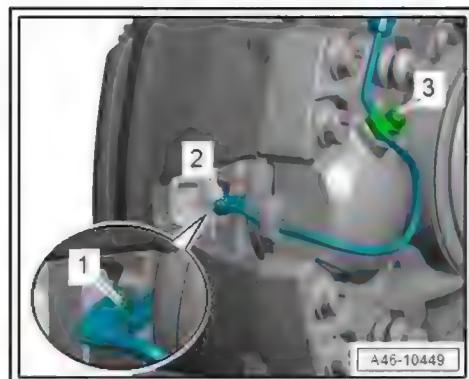


- Pull contact -1- for pad wear sender out of brake pad, paying attention to retaining clip -2-.
- Open dust cap -3-, move clear electrical wiring for pad wear sender and disengage wiring from brake caliper.



Note

*The pad wear sender must be renewed if the retaining clip -2- is lost.*

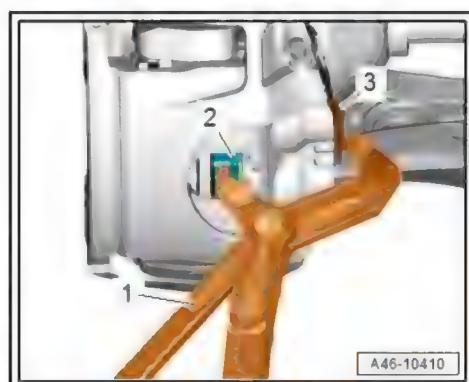


A46-10449



Note

- ◆ To make it easier to remove the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pad -2- slightly as shown in the illustration.
- ◆ To avoid damaging the paint on the caliper, insert a piece of rubber -3- between the caliper and the pliers.



A46-10410

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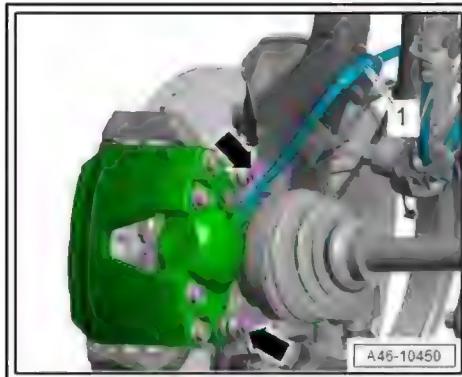
- Move brake hose -1- clear at bracket.
- Remove bolts -arrows-.
- Carefully pull brake caliper off brake disc with brake pads installed.



**Caution**

*Risk of damage to brake hose*

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*



*Risk of damage to brake caliper pistons*

- ◆ *Do not apply brake when brake caliper is removed.*

- Tie brake caliper to body with suitable wire.
- Take brake pads out of brake caliper.

**Installing**

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage when renewing brake pads.
- ◆ *Wear limit of brake discs ➔ page 6*



**Note**

- ◆ *Always renew brake pads on both sides of the axle.*
- ◆ *Install all parts supplied in the repair kit when fitting new brake pads.*



**WARNING**

*Risk to health*

- ◆ *Do not blow out the brake system with compressed air.*



**Note**

- ◆ *Use only methylated spirits to clean the brake caliper.*
- ◆ *Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit ➔ page 216.*

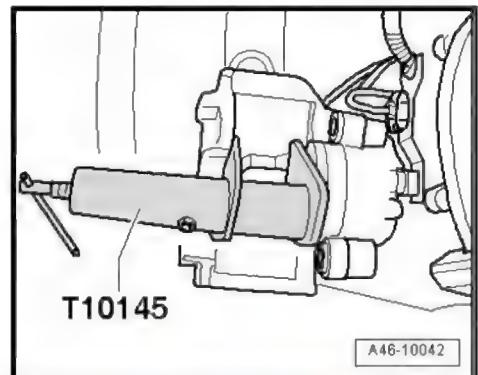


**Caution**

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

- ◆ If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.
- ◆ Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.
- ◆ Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.

- Press brake caliper pistons all the way back into caliper using piston resetting appliance - T10145- .
- Clean brake caliper.

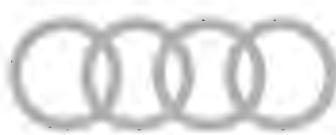
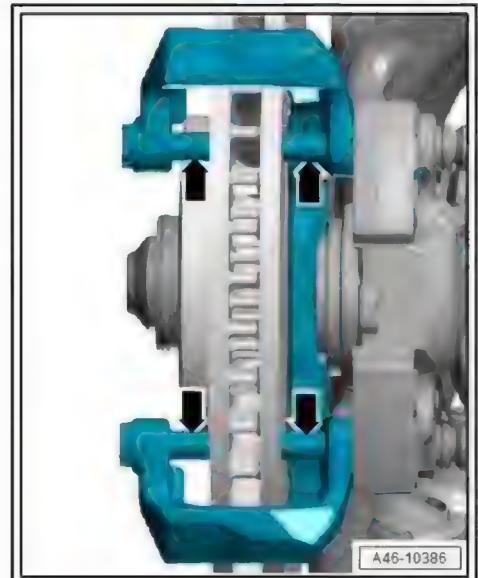


- Clean surfaces of retaining pins -arrows- that make contact with brake pads.



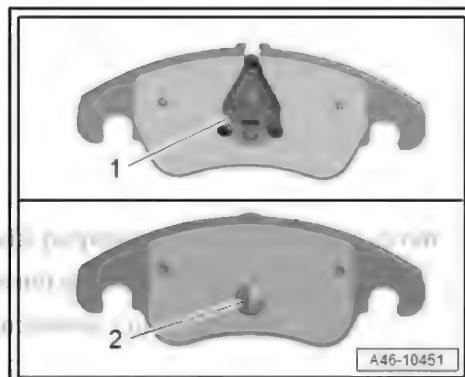
**Note**

*If there is any residual grease on the brake disc, clean the disc with brake cleaner.*



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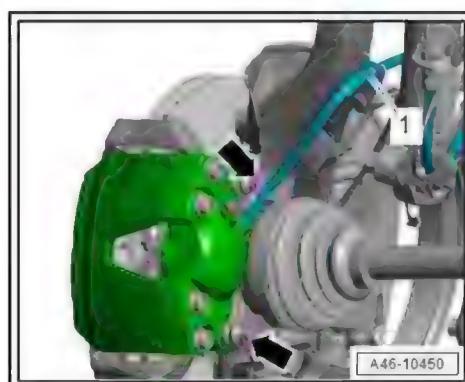
- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Clip inner brake pad with retaining spring -1- into brake caliper piston.
- Engage retaining pin -2- of outer brake pad in brake caliper.
- Carefully fit brake caliper (with pads installed) over brake disc.



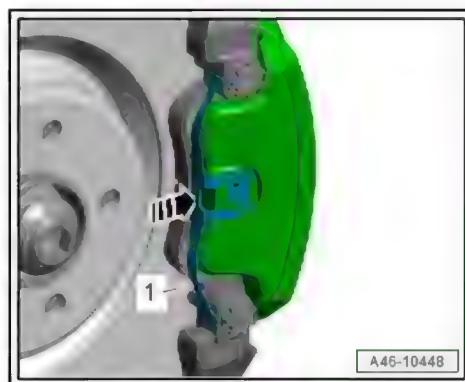
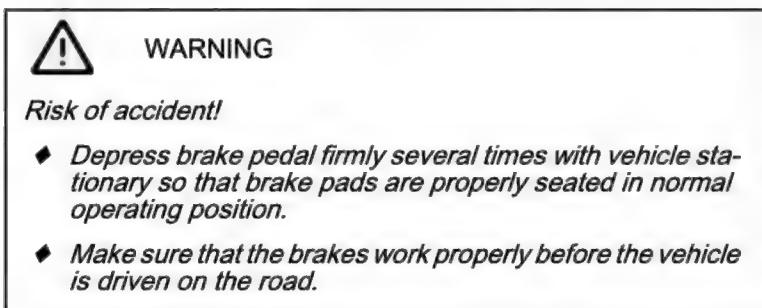
- Tighten bolts -arrows-.
- Secure brake hose -1- at bracket.

Note

- ◆ Check for damage to contact for pad wear sender and renew if necessary.
- ◆ Make sure the contact for the pad wear sender is properly seated in the brake pad.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- ◆ Take care not to damage the protective caps for the guide pins.
- ◆ Make sure the protective caps are correctly positioned.



- Install pad wear sender [⇒ page 145](#).
- Move damper spring -1- into installation position, press it in direction of -arrow- and engage it in brake caliper, as shown in illustration.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



- Check brake fluid level and top up if necessary.

**Tightening torques**

- ◆ [⇒ "1.1.1 Exploded view - front brakes, steel version \(1LA/1LJ\)", page 60](#)

## 1.2.2 Removing and installing brake pads - steel version brakes (1LF/1LL)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



V.A.G 1332



W00-11165

- ◆ Piston resetting appliance - T10145-

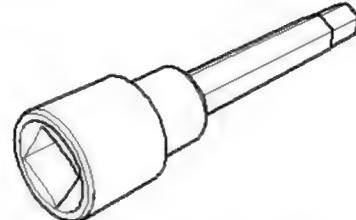
T10145



W00-11606

- ◆ Socket (9 mm) - T50036-

T50036



W00-10836

## Removing



### Note

*Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.*

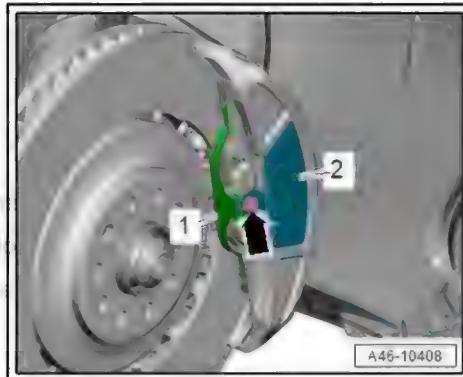
- Remove front wheel ➤ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



### WARNING

*Risk of injury.*

- ◆ The damper spring -1- is under tension. To remove damper spring, disengage it from brake caliper, taking care not to damage paint on brake caliper.

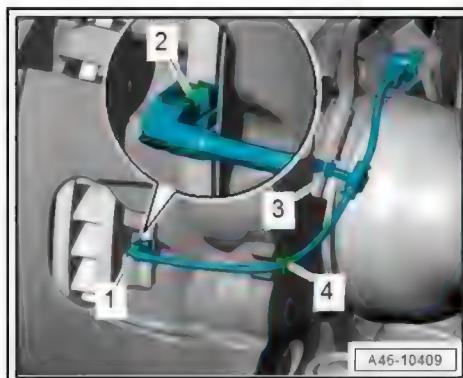


- Remove bolt -arrow-.
- Detach trim -2- and damper spring -1-.
- Pull contact -1- for pad wear sender out of brake pad, paying attention to retaining clip -2-.
- Move electrical wiring clear at brake hose -3- and retainer -4-.



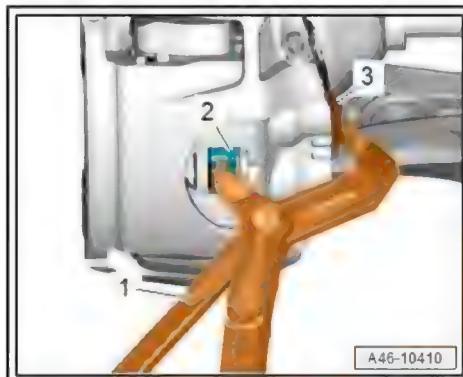
### Note

*The pad wear sender must be renewed if the retaining clip -2- is lost.*



- Note

- ◆ To make it easier to remove the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pad -2- slightly as shown in the illustration.
- ◆ To avoid damaging the paint on the caliper, insert a piece of rubber -3- between the caliper and the pliers.



- Move brake hose -1- clear at bracket.
- Remove protective caps -arrows-.
- Unscrew guide pins -2- using bit (9 mm) - T50036- and pull guide pins slightly out of brake caliper.
- Carefully pull brake caliper off brake disc with brake pads installed.



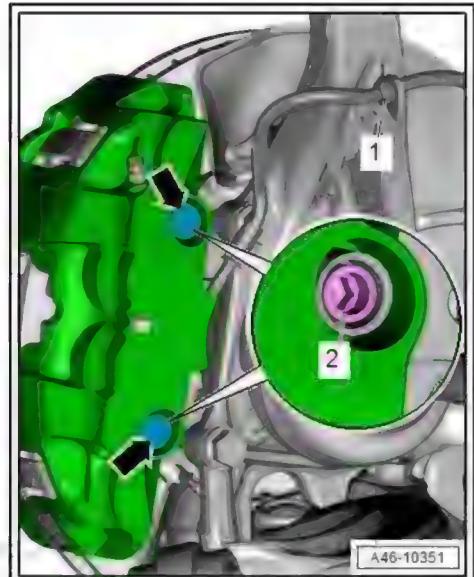
#### Caution

##### *Risk of damage to brake hose*

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*

##### *Risk of damage to brake caliper pistons*

- ◆ *Do not apply brake when brake caliper is removed.*



A46-10351

- Tie brake caliper to body with suitable wire.
- Press off brake pads in centre of caliper and take out pads.

#### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage when renewing brake pads.
- ◆ *Wear limit of brake discs* [⇒ page 6](#)



#### Note

- ◆ *Always renew brake pads on both sides of the axle.*
- ◆ *Install all parts supplied in the repair kit when fitting new brake pads.*



#### WARNING

##### *Risk to health*

- ◆ *Do not blow out the brake system with compressed air.*



#### Note

- ◆ *Use only methylated spirits to clean the brake caliper.*
- ◆ *Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit* [⇒ page 219](#).



Caution

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

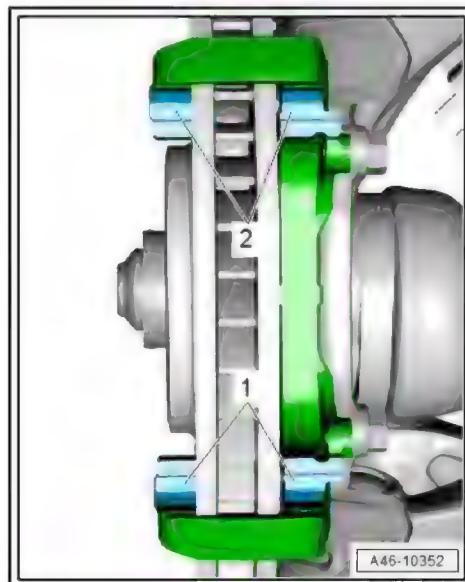
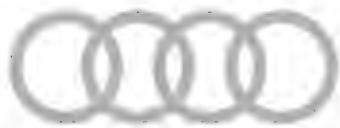
- ◆ If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.
- ◆ Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.
- ◆ Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.

- Press brake caliper pistons all the way back into caliper using piston resetting appliance - T10145- .
- Clean brake caliper.
- Clean surfaces -1, 2- of brake carrier that make contact with brake pads.



Note

*If there is any residual grease on the brake disc, clean the disc with brake cleaner.*



A46-10352

- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Clip inner brake pad -A- into brake caliper pistons.
- Clip outer brake pad -B- into brake caliper.
- Carefully fit brake caliper (with pads installed) over brake disc.



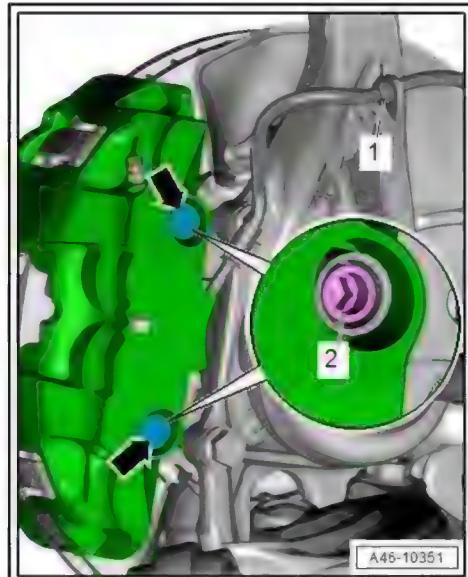
A46-10411

- Tighten guide pins -2- and press on protective caps -arrows-.
- Secure brake hose -1- at bracket.



#### Note

- ◆ Check for damage to contact for pad wear sender and renew if necessary.
- ◆ Make sure the contact for the pad wear sender is properly seated in the brake pad.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- ◆ Take care not to damage the protective caps for the guide pins.
- ◆ Make sure the protective caps are correctly positioned.
- Install contact -1- for pad wear sender [⇒ page 146](#).



A46-10351

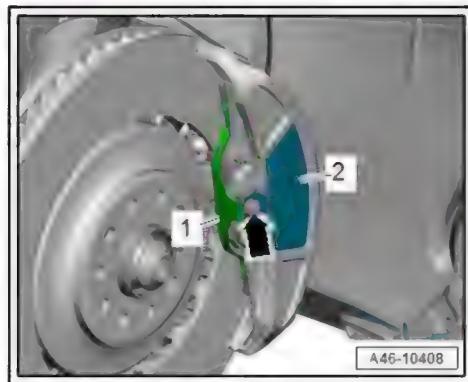
- Locate damper spring -1- and trim -2- in correct position and secure with bolt -arrow-.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



#### WARNING

##### Risk of accident!

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



A46-10408

- Check brake fluid level and top up if necessary.

#### Tightening torques

- ◆ [⇒ "1.1.2 Exploded view - front brakes, steel version \(1LF/1LL/1ZK/FM0\)", page 63](#)

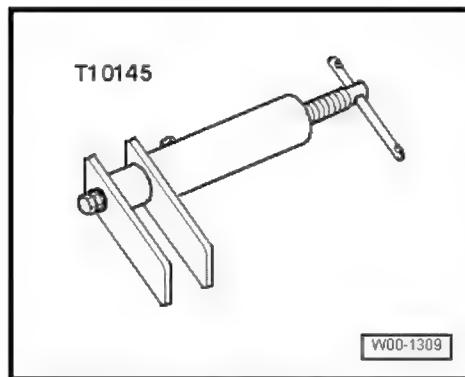
### 1.2.3 Removing and installing brake pads (1LP)

When renewing the brake pads, also check the brake disc for wear. Refer to wear limit for brake disc.

#### Special tools and workshop equipment required

Front wheel hub and bearing removal tool, universal puller, puller bar, front wheel hub and bearing assembly Audi A6, Audi A6 China and Quattro see Special tools and workshop equipment required, <http://espace.tis.ford.com> for instructions on information in this document. Issued by Audi AG.

◆ Piston resetting appliance - T 10145-



Removing

 Note

*Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.*

- Remove relevant wheel → Rep. gr. 44 ; Wheels and tyres .  
Do not remove the brake caliper to remove the brake pads.
- Unplug electrical connector for pad wear indicator wire.
- Unclip pad wear indicator wire.



Caution

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

- ◆ If the brake pads are worn and brake fluid has been topped up, brake fluid can overflow when the piston is pressed back into the brake cylinder.
- ◆ Before pressing the piston(s) back, check the brake fluid level. If the brake fluid is up to the "MAX" mark, fluid must be extracted.
- ◆ Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.

- Press back brake pistons with brake pads installed using piston resetting appliance - T10145- .

To do so, apply piston resetting appliance - T10145- to backing plates of installed brake pads and carefully press brake pads back into brake caliper.

- Press one pad retaining pin out of brake caliper from outside to inside with a punch.

It will help to press pad retaining spring -8- inwards slightly.



Note

*Make sure that paint on brake caliper is not scratched or damaged.*



**Caution**

*The pad retaining spring is under tension. Place hand in front of it for protection.*

- Press second pad retaining pin out of brake caliper from outside to inside with a punch.



Note

*Make sure that paint on brake caliper is not scratched or damaged.*

- Take brake pads out of brake caliper.

#### Installing

When renewing the brake pads, also check the brake disc for wear. Refer to wear limit for brake disc.

- Check brake disc.
- Tightening torques



Note

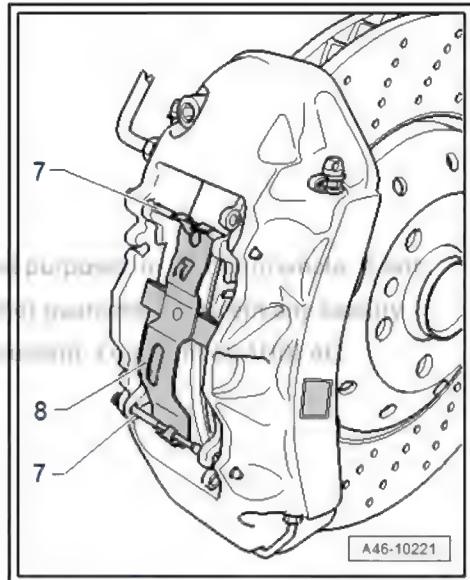
- ◆ Always renew brake pads on both sides of the axle.
- ◆ Install all parts supplied in repair kit ⇒ Electronic parts catalogue .
- ◆ Always use brake pads from the same manufacturer with the same quality for the two wheels on the same axle.
- ◆ Use only methylated spirits or commercially available brake cleaner to clean the brake caliper.

- Clean brake caliper.
- If fitted, pull protective foil off pad backplates.
- Insert brake pads into brake caliper.



Note

*The brake pad with the wear indicator wire is located on the inside.*



- Insert pad retaining spring -8-.



Note

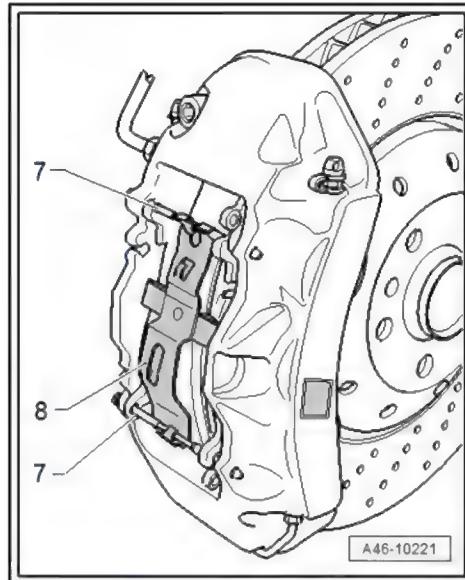
*Ensure that pad retaining spring is seated correctly.*

- Push one pad retaining pin -7- through hole in brake caliper from inside to outside. If necessary, use punch to press pad retaining pin as far as stop.



Caution

*The pad retaining pin must be seated securely in both holes so that it cannot come loose.*



Note

- ◆ The pad retaining spring -8- is located under the pad retaining pin -7-. The spring at the end of the pad retaining pin holds the pad retaining pin in place in the brake caliper.
- ◆ Make sure that paint on brake caliper is not scratched or damaged.

- Push second pad retaining pin through hole in brake caliper from inside to outside. While doing so, press down pad retaining spring. If necessary, use punch to press pad retaining pin as far as stop.

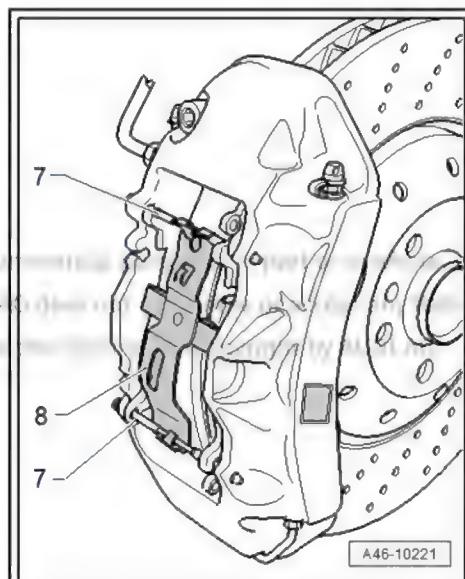
It will help to press pad retaining spring -8- inwards slightly.



Note

- ◆ The pad retaining spring -8- is located under the pad retaining pin -7-. The spring at the end of the pad retaining pin holds the pad retaining pin in place in the brake caliper.
- ◆ Make sure that paint on brake caliper is not scratched or damaged.

- Connect pad wear indicator wire.
- Clip in pad wear indicator wire.
- Fit wheels ⇒ Rep. gr. 44 ; Wheels and tyres .
- Check brake fluid level and top up if necessary.



WARNING

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

### 1.2.4 Removing and installing brake pads - steel version brakes (1LU)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



V.A.G 1332



W00-11165

- ◆ Piston resetting appliance - T10145-

T10145



W00-11606

#### Removing

- Remove relevant brake caliper [⇒ page 116](#).
- Remove pad wear sender [⇒ page 148](#).



Note

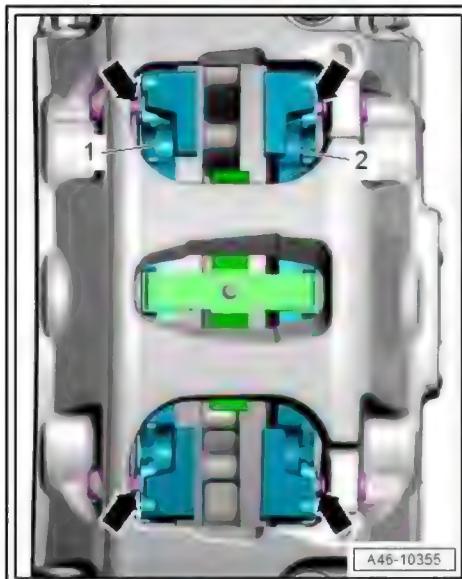
*Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.*

- Detach brake pads -1 and 2- from guide pins -arrows-, one after the other.



Caution

*Do not unscrew guide pins -arrows-.*



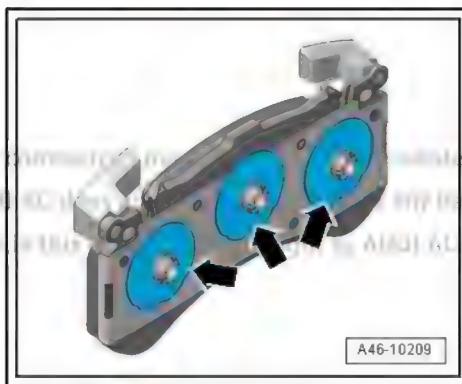
A46-10355



Note



- ◆ The spring plates -arrows- on the back of the brake pads must not be damaged if the pads are to be reinstalled.
- ◆ All spring plates must be attached on the back of the brake pad.
- ◆ All three spring plates on the brake pad must be renewed if one of the spring plates on that pad is damaged or has come loose.



A46-10209



Note

- ◆ Use new spring plates when installing new brake pads. Insert spring plates into brake pistons before fitting brake pads.
- ◆ If the old brake pads are being reinstalled, fit the brake pads with the bonded spring plates into the brake caliper.

- The pad retaining spring must also be renewed when the brake pads are renewed. To do so, use a screwdriver to pry pad retaining spring -1- out of brake caliper -arrow-.

#### Installing

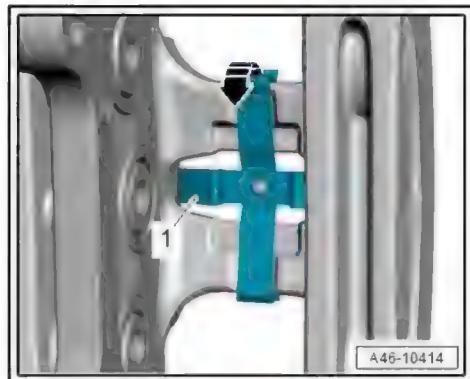
Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage when renewing brake pads.
- ◆ Wear limit of brake discs ⇒ [page 6](#)



#### Note

- ◆ Always renew brake pads on both sides of the axle.
- ◆ Install all parts supplied in the repair kit when fitting new brake pads.
- ◆ Use new spring plates.



#### WARNING

##### Risk to health

- ◆ Do not blow out the brake system with compressed air.



#### Note

- ◆ Use only methylated spirits to clean the brake caliper.
- ◆ Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit ⇒ [page 223](#).



#### Caution

Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.

- ◆ If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.
- ◆ Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.
- ◆ Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.

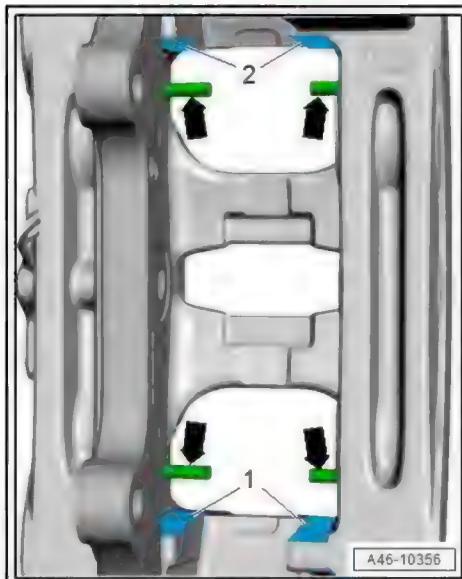
- Press brake caliper pistons all the way back into caliper using piston resetting appliance - T10145- .
- Clean brake caliper.

- Clean surfaces -1, 2- on brake caliper that make contact with brake pads and clean guide pins -arrows-.



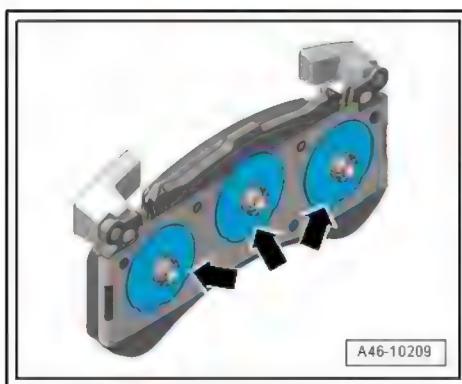
Caution

*Do not unscrew guide pins -arrows-.*



A46-10356

- Clip pad retaining spring into brake caliper.
- The pad retaining spring must engage fully in the brake caliper.



A46-10209

- If brake pads are being renewed, press spring plates -arrows- into brake caliper pistons before fitting brake pads.



Note

- ◆ Use new spring plates -arrows- when installing new brake pads. Insert spring plates into brake pistons before fitting brake pads.
- ◆ If the old brake pads are being reinstalled, fit the brake pads with the bonded spring plates into the brake caliper.
- Detach foils from new spring plates.



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- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Insert brake pads -1- into brake caliper one after the other, pressing each pad against pad retaining spring -arrows A- and fully onto guide pins -arrow B-.
- Install brake caliper [⇒ page 116](#).
- Install pad wear sender [⇒ page 148](#).
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



#### WARNING

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



- Check brake fluid level and top up if necessary.

Tightening torques

- ◆ [⇒ "1.1.6 Exploded view - front brakes, steel version \(1LU\)", page 70](#)

### 1.2.5 Removing and installing brake pads - steel version brakes (1LM/1LX)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166

- ◆ Piston resetting appliance - T10145-

T10145



W00-11606

- ◆ Punch (commercially available)

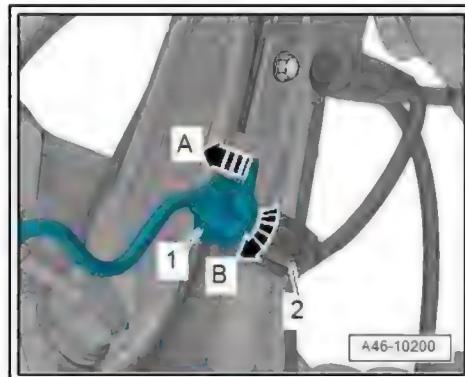
## Removing



### Note

*Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.*

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unplug electrical connector -2- for pad wear sender.
- Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.



- Move clear electrical wire -3- for pad wear sender: to do so, open dust cap -2- and unclip wire at brake caliper -arrow-.



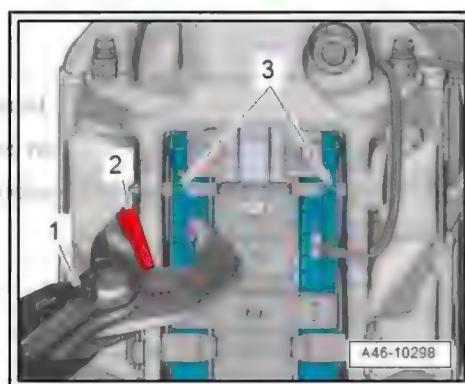
### Note

*Disregard -item 1-.*



### Note

*To make it easier to remove the brake pads from the brake caliper, use suitable pliers -1- to press back the brake pads -3- slightly. To avoid damaging the paint on the caliper, insert a piece of rubber -2- between the caliper and the pliers.*



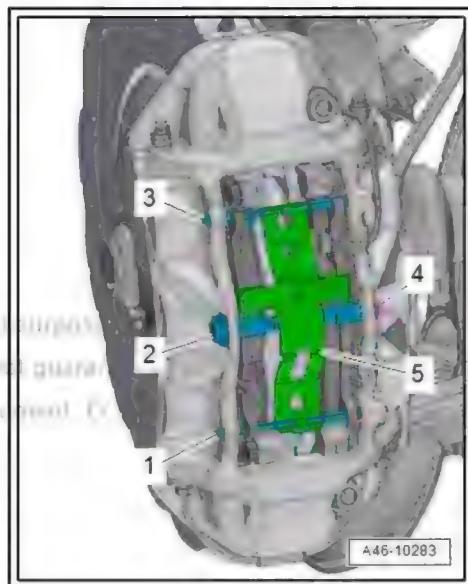


### WARNING

*Risk of injury.*

- ◆ The brake pad retaining spring -5- is under tension. Hold down the pad retaining spring by hand while knocking out the retaining pin.

- Use a suitable punch to knock bottom pad retaining pin -1- inwards out of brake caliper.
- Use a suitable punch to knock top pad retaining pin -3- inwards out of brake caliper and detach pad retaining spring -5-.
- Remove bolt -4-.
- Pull centre retaining pin -2- out of brake caliper.



A46-10283

- Take brake pads -1 and 3- out of brake caliper.



Note

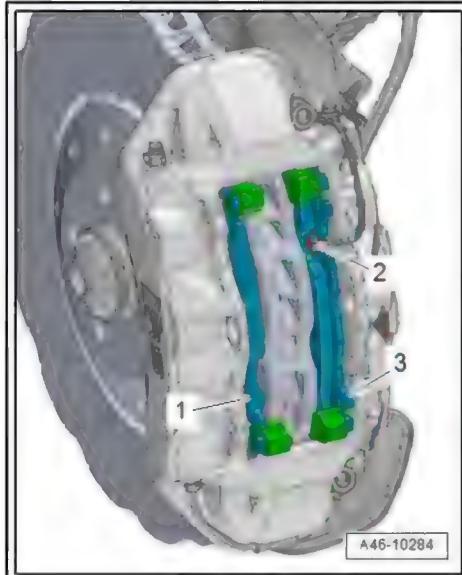
Disregard -item 2-.



Caution

*Risk of damage to brake caliper pistons*

- ◆ *Do not apply brake when brake caliper is removed.*



### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage when renewing brake pads.
- ◆ Wear limit of brake discs [⇒ page 6](#)



Note

- ◆ *Always renew brake pads on both sides of the axle.*
- ◆ *Install all parts supplied in the repair kit when fitting new brake pads.*



WARNING

*Risk to health*

- ◆ *Do not blow out the brake system with compressed air.*



Note

- ◆ *Use only methylated spirits to clean the brake caliper.*
- ◆ *Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit [⇒ page 219](#).*



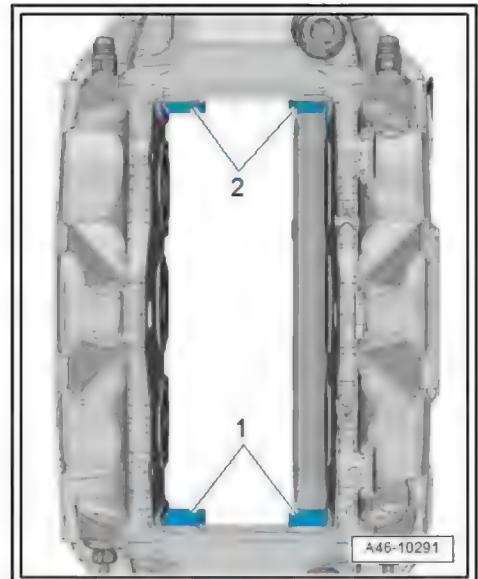
Caution

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

- ◆ *If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.*
- ◆ *Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.*
- ◆ *Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.*

- Press brake caliper pistons all the way back into caliper using piston resetting appliance - T10145- .

- Clean brake caliper.
- Clean surfaces -1, 2- on brake caliper that make contact with brake pads.



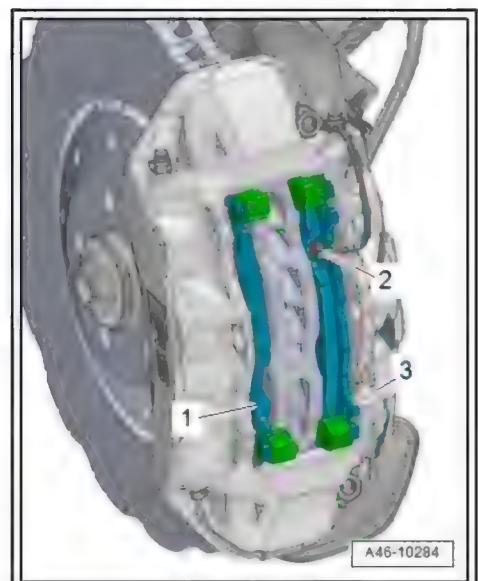
- Clip in pad wear sender -2-.
- If reinstalling used brake pads, check that pad wear sender is undamaged and correctly seated.



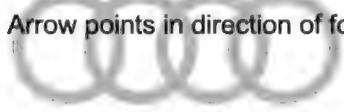
Note

*Renew pad wear sender if damaged.*

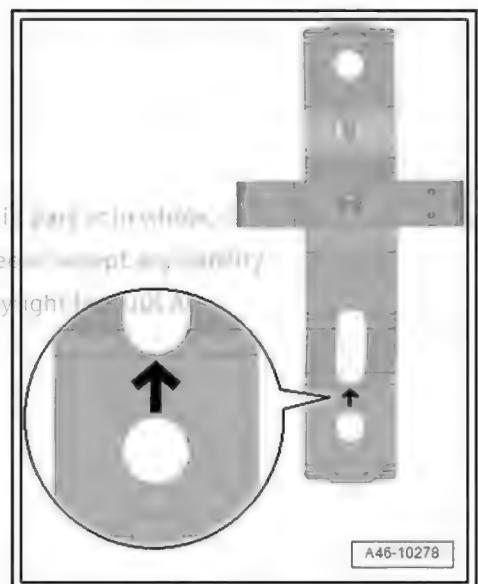
- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Fit brake pads -1 and 3- in brake caliper.
- The brake pad with the retainer for the pad wear sender is fitted on the inside.



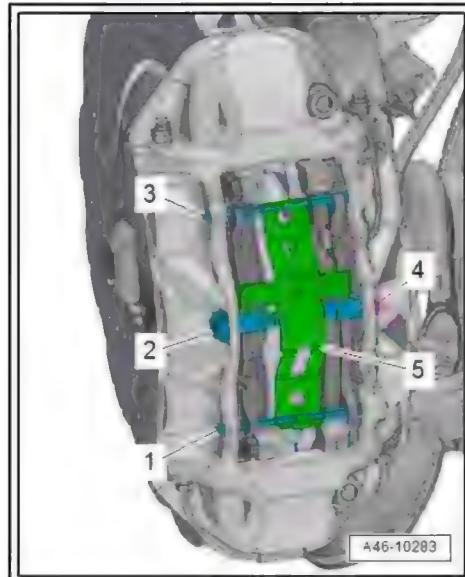
- Note correct position of pad retaining spring:
- Arrow points in direction of forward wheel rotation.



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- Fit centre retaining pin -2- and secure with new bolt -4-.
- Fit top pad retaining pin -3- in brake caliper together with pad retaining spring -5-.
- Knock pad retaining pin into brake caliper as far as stop.
- Press down bottom part of pad retaining spring and knock bottom pad retaining pin -1- into brake caliper as far as stop.

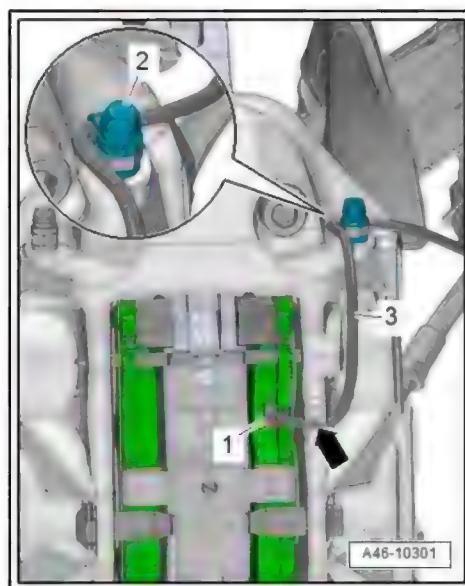


- Secure electrical wire -3- for pad wear sender: to do so insert wire into brake caliper -arrow- and secure with dust cap -2- as shown in illustration.



Note

*Disregard -item 1-.*



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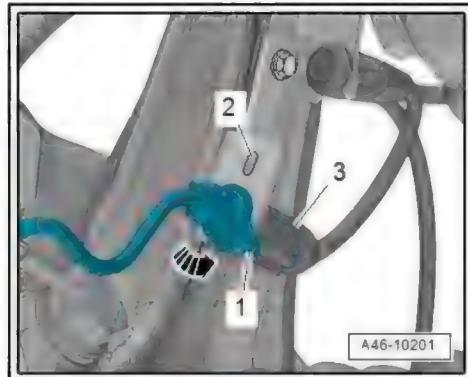
- Locate electrical connector in installation position and turn in direction of -arrow- until tab -1- engages in hole -2- in bracket.
- Plug in electrical connector -3-.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



#### WARNING

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*



A46-10201

- Check brake fluid level and top up if necessary.

Tightening torques

- ◆ *⇒ "1.1.7 Exploded view - front brakes, steel version (1LM/1LX)", page 74*

#### 1.2.6 Removing and installing brake pads - ceramic brakes (1LN/1LW)

- Check brake discs for wear and damage when renewing brake pads.
  - ◆ Cracks in the bolted joint area *⇒ page 12*
  - ◆ Edge fractures *⇒ page 13*
  - ◆ Chipping *⇒ page 13*
  - ◆ Cracks extending into cooling channels *⇒ page 14*
  - ◆ Assessing degree of wear *⇒ page 14*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332



W00-11165

◆ Piston resetting appliance - T10145-



**i** Note

- ◆ Always renew brake pads on both sides of the axle.
- ◆ Install all parts supplied in the repair kit when fitting new brake pads.

Removing

- Remove relevant brake caliper [⇒ page 121](#).
- Remove pad wear sender [⇒ page 150](#).

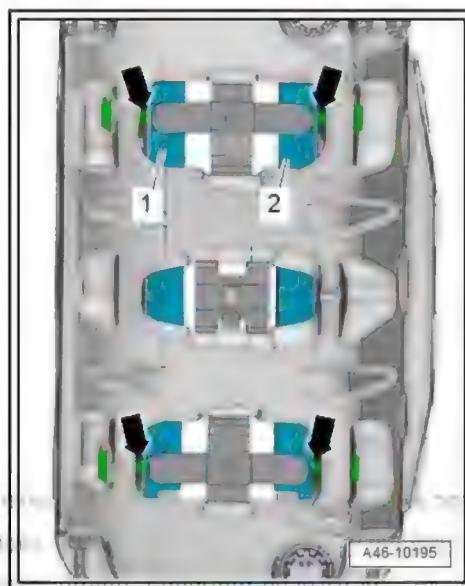
**i** Note

Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.

- Detach brake pads -1 and 2- from guide pins -arrows-, one after the other.



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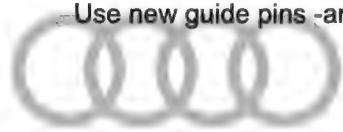
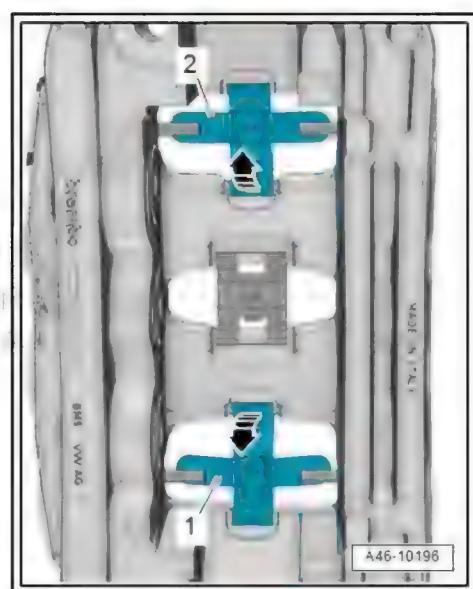
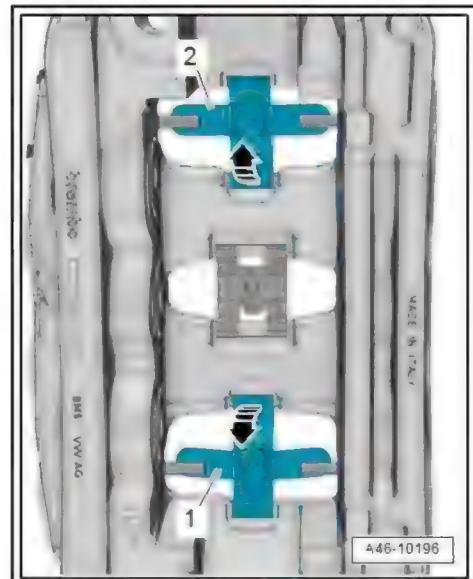


- The pad retaining springs and guide pins must also be renewed when the brake pads are renewed. Use a screwdriver to pry pad retaining springs -1 and 2- out of brake caliper -arrows-.
- Unscrew guide pins for brake pads.

#### Installing

Installation is carried out in reverse order; note the following:

Use new repair kit ⇒ Electronic parts catalogue "ETKA".



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Clean threads in brake caliper before screwing in new guide pins.



**WARNING**

**Risk to health**

- ◆ *Do not blow out the brake system with compressed air.*



**Note**

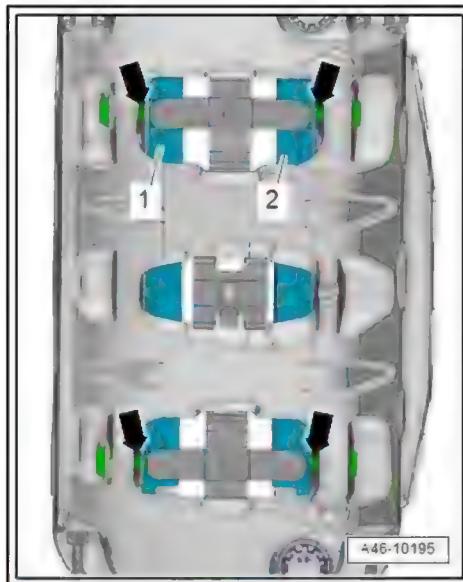
- ◆ *Use only methylated spirits to clean the brake caliper.*
- ◆ *Do not clean ceramic brake disc with fluids.*
- ◆ *Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit ➡ page 223 .*



**Caution**

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

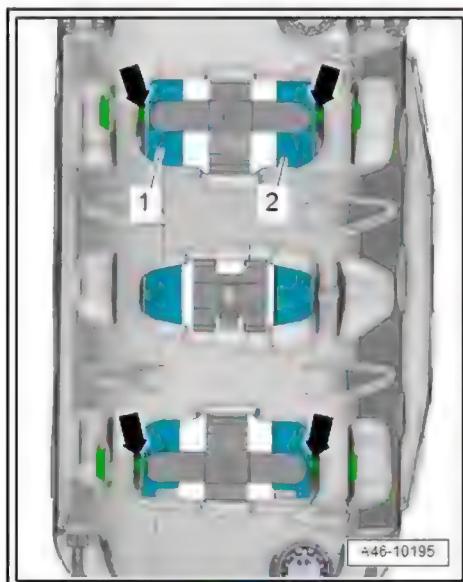
- ◆ *If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.*
- ◆ *Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.*
- ◆ *Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.*



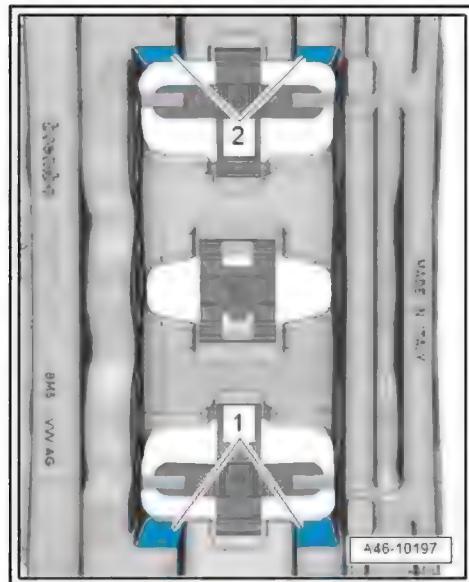
- Press brake caliper pistons all the way back into caliper using piston resetting appliance - T10145- .
- Clean brake caliper.
- Clean threads in brake caliper before screwing in new guide pins.

Screw in new guide pins -arrows- for brake pads and tighten to 24 Nm.

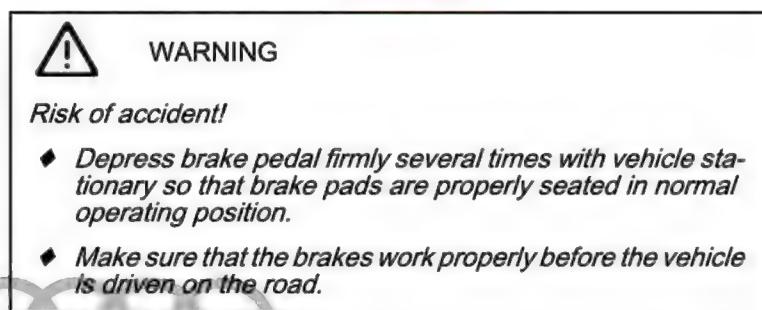
- Clip new pad retaining springs into brake caliper.
- The pad retaining springs must engage fully in the brake caliper.



- Clean surfaces -1, 2- on brake caliper that make contact with brake pads.



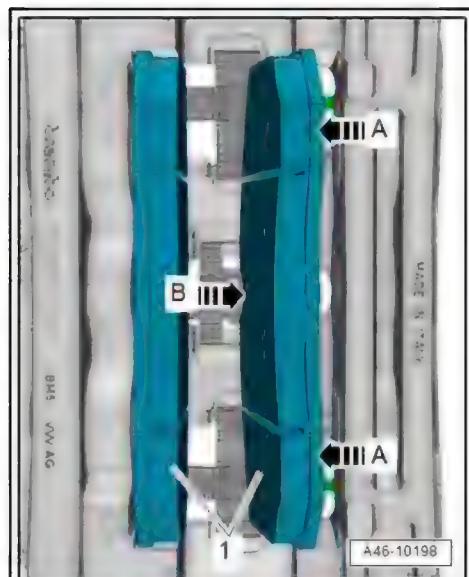
- Insert brake pads -1- into brake caliper one after the other, pressing each pad against pad retaining springs -arrows A- and fully onto guide pins -arrow B-.
- Install brake caliper [⇒ page 121](#).
- Install pad wear sender [⇒ page 150](#).



- Check brake fluid level and top up if necessary.

#### Tightening torques

Please refer to "1.1.8 Exploded view - front brakes, ceramic version (1LN/1LW)", page 77



## 1.3 Removing and installing brake caliper

- ⇒ “1.3.1 Removing and installing brake caliper - steel version brakes (1LA/1LJ)”, page 108
- ⇒ “1.3.2 Removing and installing brake caliper - steel version brakes (1LF/1LL)”, page 110
- ⇒ “1.3.3 Removing and installing brake caliper (1LP)”, page 113
- ⇒ “1.3.4 Removing and installing brake caliper - steel version brakes (1LU)”, page 116
- ⇒ “1.3.5 Removing and installing brake caliper - steel version brakes (1LM/1LX)”, page 118
- ⇒ “1.3.6 Removing and installing brake caliper - ceramic brakes (1LN/1LW)”, page 121

### 1.3.1 Removing and installing brake caliper - steel version brakes (1LA/1LJ)



Note

In the following procedure the brake caliper is removed together with the brake carrier and brake pads. The brake hose remains connected.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



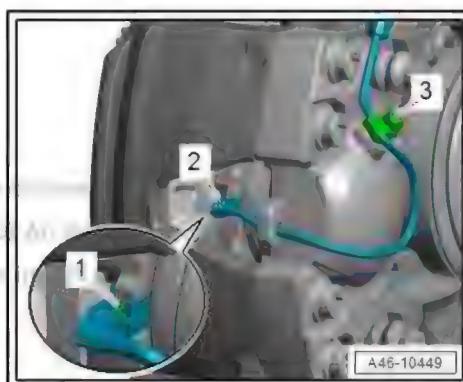
#### Removing

- Remove front wheel ⇒ [Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .]
- Open dust cap -2-, move clear electrical wiring for pad wear sender and disengage wiring from brake caliper.
- Pull contact -3- for pad wear sender out of brake pad, paying attention to retaining clip -1-.



Note

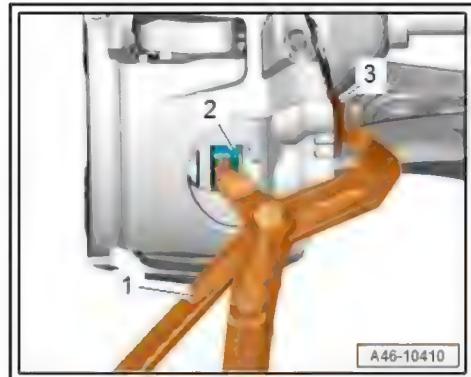
The pad wear sender must be renewed if the retaining clip -1- is lost.





### Note

- ◆ To make it easier to remove the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pad -2- slightly as shown in the illustration.
- ◆ To avoid damaging the paint on the caliper, insert a piece of rubber -3- between the caliper and the pliers.



A46-10410

- Move brake hose -1- clear at bracket.
- Remove bolts -arrows- and carefully pull brake caliper and brake carrier off brake disc with pads installed.



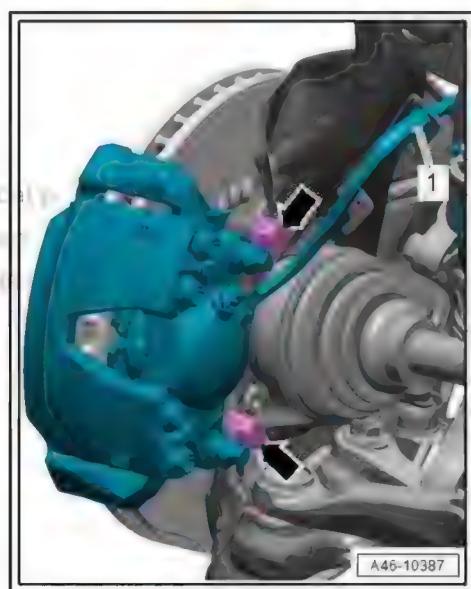
### Caution

#### Risk of damage to brake hose

- ◆ Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.
- ◆ The brake hose must be renewed if it is damaged.

#### Risk of damage to brake caliper pistons

- ◆ Do not apply brake when brake caliper is removed.



A46-10387

- Use a suitable length of wire to tie up brake caliper with brake carrier on the body.

### Installing

Installation is carried out in reverse order; note the following:



### Note

*Renew bolts for brake carrier after removal.*



### WARNING

#### Risk to health

- ◆ Do not blow out the brake system with compressed air.



### Note

*Use only methylated spirits to clean the brake caliper.*

- Clean brake caliper.

- Slide brake caliper with brake carrier and brake pads fitted carefully over brake disc.
- Tighten new bolts -arrows-.
- Secure brake hose -1- at bracket.
- Install pad wear sender [⇒ page 145](#).

 Note

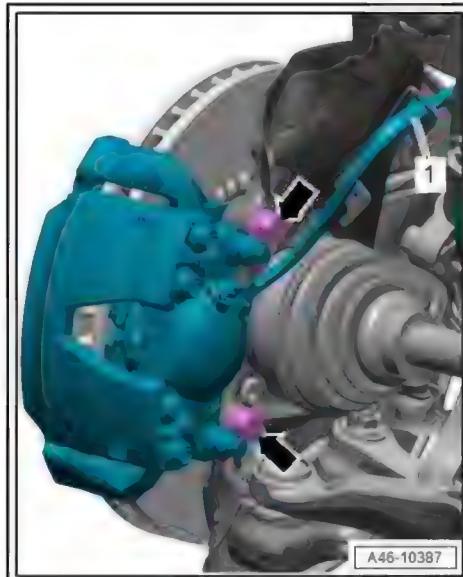
- ◆ Make sure the electrical connector and brake hose are positioned correctly.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



**WARNING**

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



**Tightening torques**

- ◆ [⇒ "1.1.1 Exploded view - front brakes, steel version \(1LA/1LJ\)", page 60](#)

### 1.3.2 Removing and installing brake caliper - steel version brakes (1LF/1LL)

 Note

In the following procedure the brake caliper is removed together with the brake carrier and brake pads. The brake hose remains connected.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



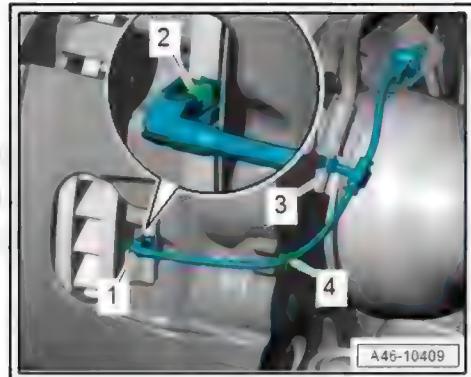
### Removing

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Pull contact -1- for pad wear sender out of brake pad, paying attention to retaining clip -2-.
- Move electrical wiring clear at brake hose -3- and retainer -4-.



#### Note

*The pad wear sender must be renewed if the retaining clip -2- is lost.*

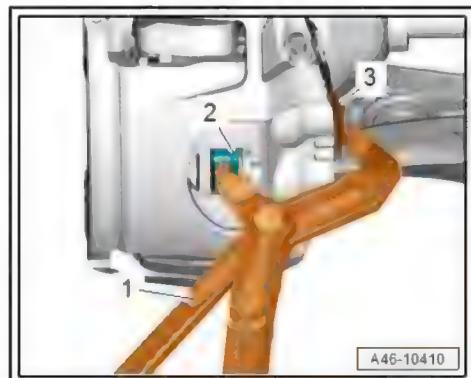


A46-10409



#### Note

- ◆ To make it easier to remove the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pad -2- slightly as shown in the illustration.
- ◆ To avoid damaging the paint on the caliper, insert a piece of rubber -3- between the caliper and the pliers.



A46-10410

- Move brake hose -1- clear at bracket.
- Remove bolts -arrows- and carefully pull brake caliper and brake carrier off brake disc with pads installed.



**Caution**

*Risk of damage to brake hose*

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*

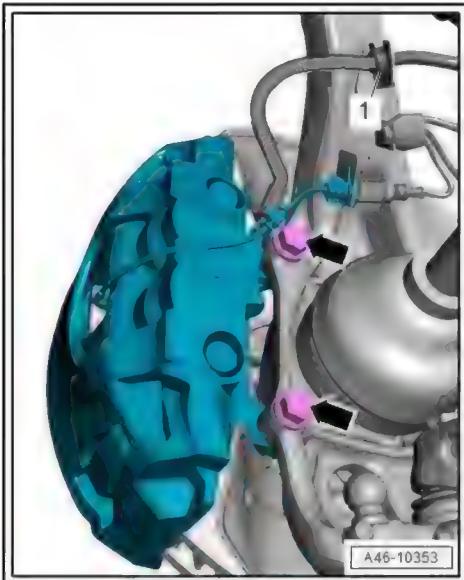
*Risk of damage to brake caliper pistons*

- ◆ *Do not apply brake when brake caliper is removed.*

- Tie brake caliper to body with suitable wire.

**Installing**

Installation is carried out in reverse order; note the following:



**Note**

*Renew bolts for brake carrier after removal.*



**WARNING**

*Risk to health*

- ◆ *Do not blow out the brake system with compressed air.*



**Note**

*Use only methylated spirits to clean the brake caliper.*

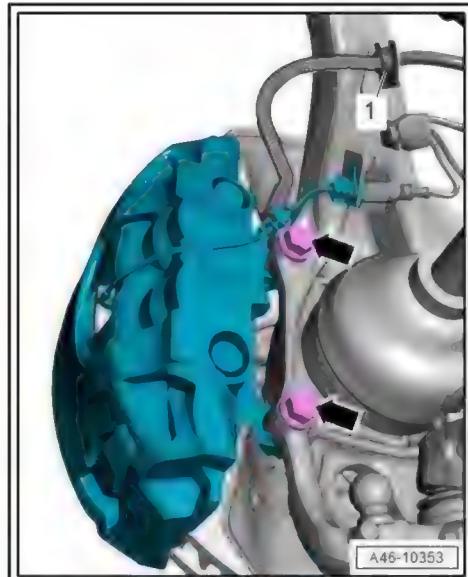
- Clean brake caliper.

- Slide brake caliper with brake carrier and brake pads fitted carefully over brake disc.
- Tighten new bolts -arrows-.
- Secure brake hose -1- at bracket.
- Install pad wear sender ⇒ [page 146](#) .



#### Note

- ◆ *Make sure the electrical connector and brake hose are positioned correctly.*
- ◆ *The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.*
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



#### WARNING

##### *Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

#### Tightening torques

- ◆ ⇒ “[1.1.2 Exploded view - front brakes, steel version \(1LF/1LL/1ZK/FM0\)](#)”, page 63

### 1.3.3 Removing and installing brake caliper (1LP)



#### Caution

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

- ◆ *If the brake pads are worn and brake fluid has been topped up, brake fluid can overflow when the piston is pressed back into the brake cylinder.*
- ◆ *Before pressing the piston(s) back, check the brake fluid level. If the brake fluid is up to the "MAX" mark, fluid must be extracted.*
- ◆ *Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.*

#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-
- ◆ Ratchet - V.A.G. 1332/1-

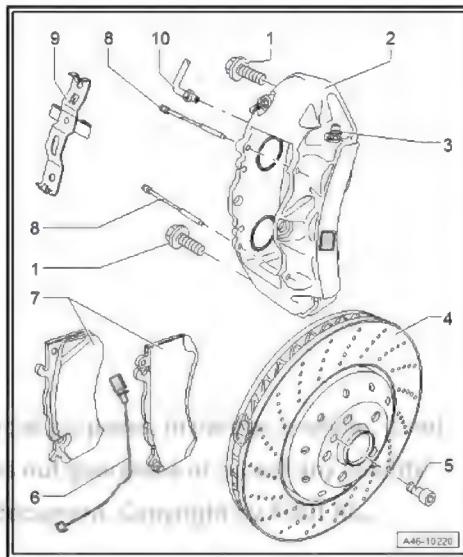
#### Removing

- Remove relevant front wheel ⇒ Rep. gr. 44 ; Wheels and tyres .

- Unclip brake hose from retainer on wheel bearing housing.
- Unclip pad wear indicator wire.
- Remove bolts -1-.



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### Note

To make it easier to detach the brake caliper from the brake disc, use pliers to press the brake pads back slightly. To avoid damaging the caliper, insert a piece of rubber -2- or similar. Take care not to damage the pad wear indicator wire.

- Carefully detach brake caliper with brake pads installed.



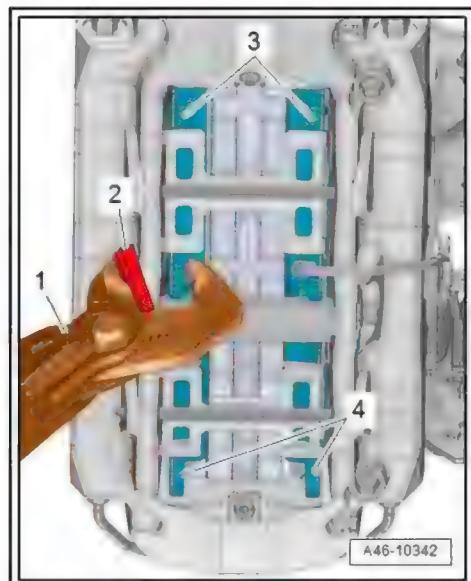
### Note

*Brake caliper must not be dismantled. Do not loosen any bolts on the brake caliper.*



### Caution

- ◆ Do not leave the brake caliper with brake carrier hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.
- ◆ The brake hose must be renewed if it is damaged.
- ◆ Do not apply brake when brake caliper is removed.



### Installing

- Tightening torques



### Note

- ◆ Use new bolts ⇒ Electronic parts catalogue .
- ◆ Use only methylated spirits or commercially available brake cleaner to clean the brake caliper.

- Clean brake caliper.
- Carefully press brake caliper and brake carrier (with brake pads fitted) over brake disc.
- Secure brake caliper using new bolts.
- Tightening torques
- Clip brake hose into retainer on wheel bearing housing.
- Clip in pad wear indicator wire.
- Fit wheels ⇒ Rep. gr. 44 ; Wheels and tyres .
- Check brake fluid level and top up if necessary.



### WARNING

#### Risk of accident!

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

### 1.3.4 Removing and installing brake caliper - steel version brakes (1LU)



Note

In the following procedure the brake caliper is removed together with the brake carrier and brake pads. The brake hose remains connected.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



Removing



Caution

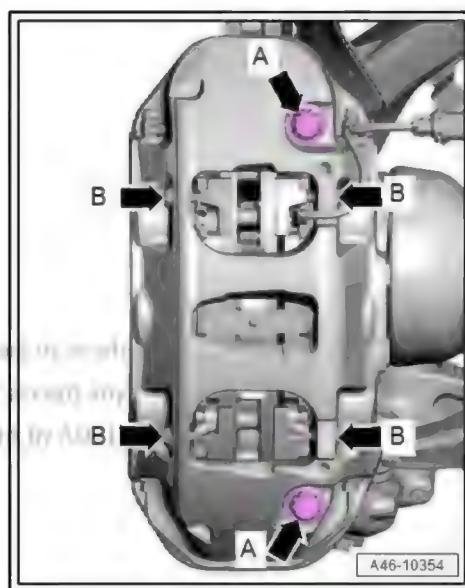
Risk of malfunction

- ◆ DO NOT slacken off bolts -arrows A- on brake caliper.
- ◆ Do not unscrew guide pins -arrows B-.

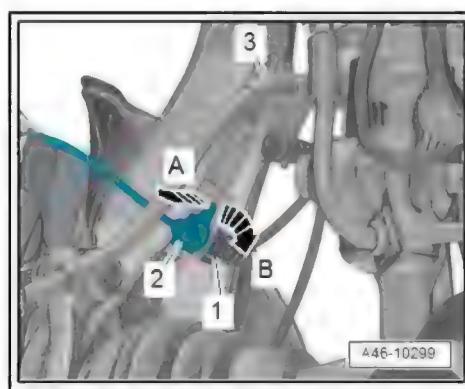


Note

Only renew guide pins on ceramic brakes.



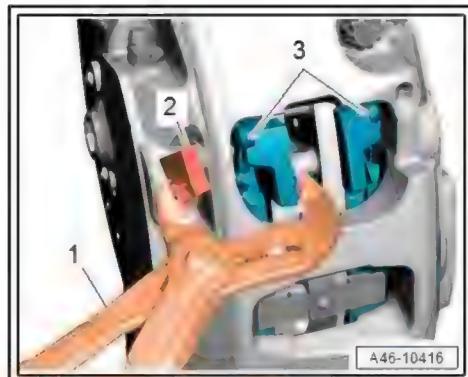
- Remove front wheel ➤ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.
- Move brake hose -3- clear at bracket.





Note

- ◆ To make it easier to detach the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pads -3- slightly.
- ◆ To avoid damaging the paint on the caliper, insert a piece of rubber -2- between the caliper and the pliers.



A46-10416

- Remove bolts -1- and carefully pull brake caliper and brake carrier off brake disc with pads installed.



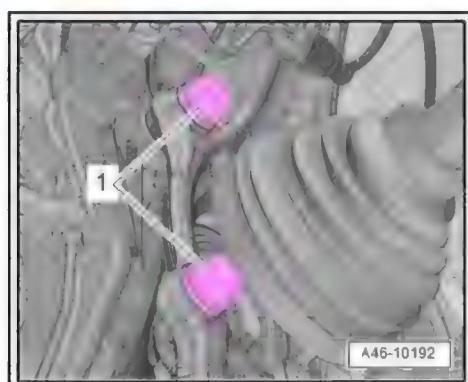
Caution

*Risk of damage to brake hose*

- ◆ Do not leave the brake caliper with brake carrier hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.
- ◆ The brake hose must be renewed if it is damaged.

*Risk of damage to brake caliper pistons*

- ◆ Do not apply brake when brake caliper is removed.



A46-10192

- Tie brake caliper to body with suitable wire.

Installing

Installation is carried out in reverse order; note the following:



Note

*Renew bolts for brake carrier after removal.*



WARNING

*Risk to health*

- ◆ Do not blow out the brake system with compressed air.

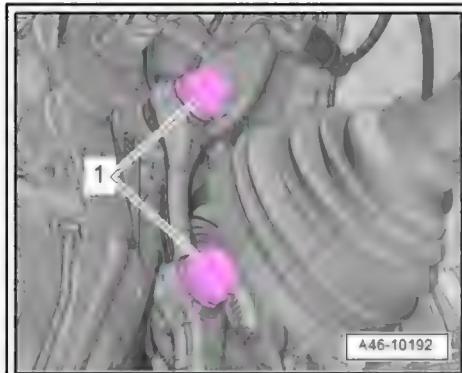


Note

*Use only methylated spirits to clean the brake caliper.*

- Clean brake caliper.
- Carefully fit brake caliper (with pads installed) over brake disc.

- Tighten new bolts -1-.

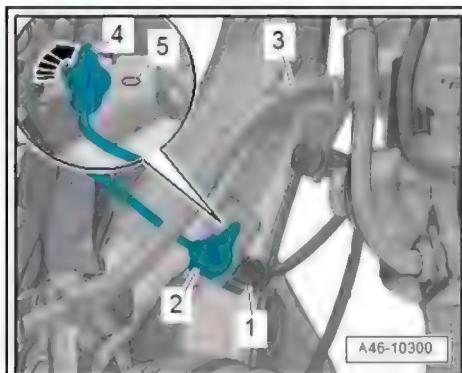


- Secure brake hose -3- at bracket.
- Bring electrical connector -2- into installation position and turn in direction of -arrow- until tab -4- engages in slot -5- on bracket.
- Plug in electrical connector -1-.

 Note

- ◆ Make sure the electrical connector and brake hose are positioned correctly.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.

- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



**WARNING**

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

Tightening torques

- ◆ [⇒ "1.1.6 Exploded view - front brakes, steel version \(1LU\)"  
page 70](#)

### 1.3.5 Removing and installing brake caliper - steel version brakes (1LM/1LX)

 Note



In the following procedure the brake caliper is removed together with the brake pads. The brake hose remains connected.

**Special tools and workshop equipment required**

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- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332



W00-11165

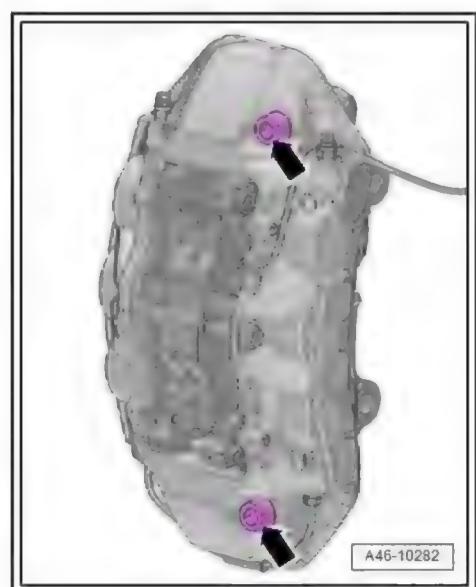
### Removing



**Caution**

*Risk of malfunction*

- ◆ *DO NOT slacken off bolts -arrows- on brake caliper.*



A46-10282

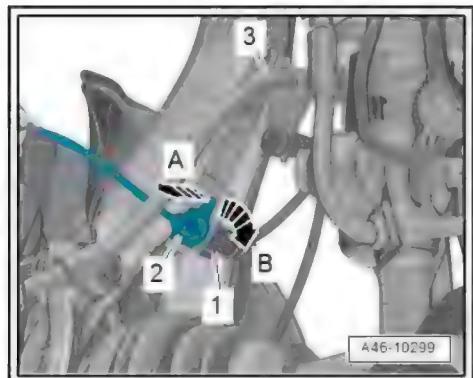
- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.
- Move brake hose -3- clear at bracket.



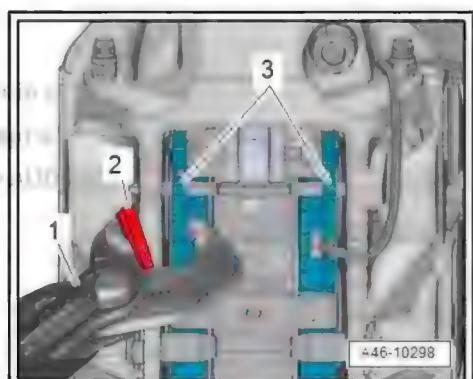
**Note**

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*To make it easier to detach the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pads -3- slightly. with To avoid damaging the paint on the caliper, insert a piece of rubber -2- between the caliper and the pliers.*



A46-10299



A46-10298

- Remove bolts -1- and carefully pull brake caliper off brake disc with brake pads installed.



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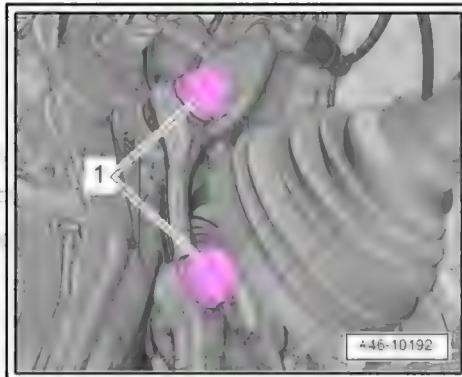
**Risk of damage to brake hose**  
permitted unless authorised by AUDI AG. AUDI AG does not guarantee the protection of third party rights.

◆ **Do not leave the brake caliper with brake carrier hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.**

◆ **The brake hose must be renewed if it is damaged.**

**Risk of damage to brake caliper pistons**

◆ **Do not apply brake when brake caliper is removed.**



- Tie brake caliper to body with suitable wire.

#### Installing

Installation is carried out in reverse order; note the following:



#### Note

*Renew bolts for brake carrier after removal.*



#### WARNING

**Risk to health**

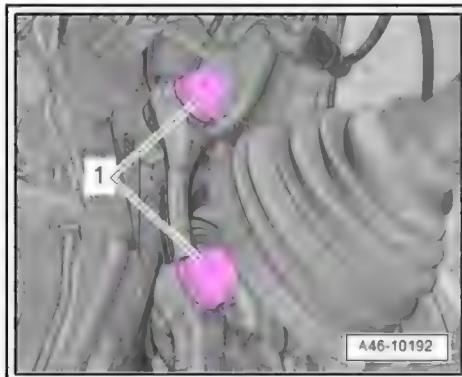
◆ **Do not blow out the brake system with compressed air.**



#### Note

*Use only methylated spirits to clean the brake caliper.*

- Clean brake caliper.
- Carefully fit brake caliper (with pads installed) over brake disc.
- Tighten new bolts -1-.

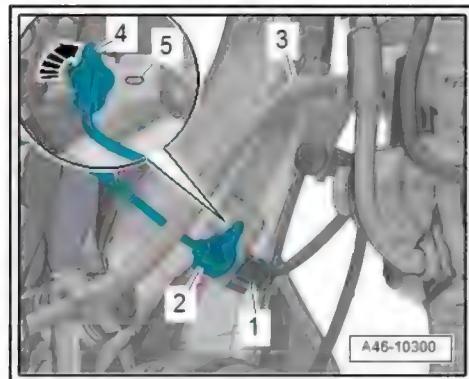


- Secure brake hose -3- at bracket.
- Locate electrical connector -2- in installation position and turn in direction of -arrow- until tab -4- engages in hole -5- in bracket.
- Plug in electrical connector -1-.



Note

- ◆ Make sure the electrical connector and brake hose are positioned correctly.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.



- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



**WARNING**

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

Tightening torques

- ◆ ⇒ "1.1.7 Exploded view - front brakes, steel version (1LM/1LX)", page 74

### 1.3.6 Removing and installing brake caliper - ceramic brakes (1LN/1LW)



Note

In the following procedure the brake caliper is removed together with the brake pads. The brake hose remains connected.

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



## Removing

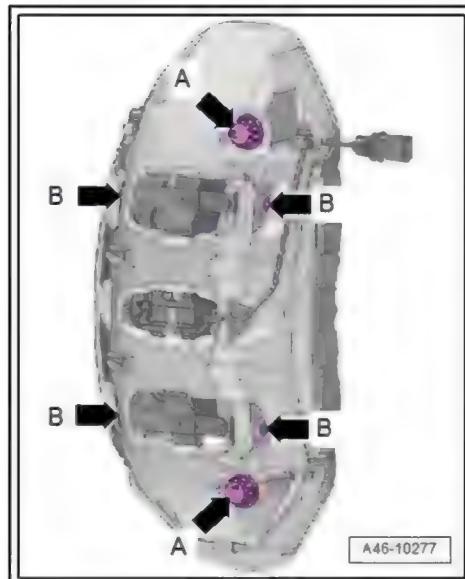


Caution

### Risk of malfunction

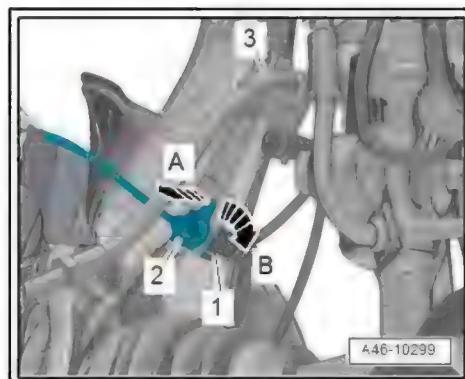
- ◆ **DO NOT slacken off bolts -arrows A- on brake caliper.**
- ◆ **Renew guide pins -arrows B- after removal (24 Nm).**

- Remove front wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



A46-10277

- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.
- Move brake hose -3- clear at bracket.

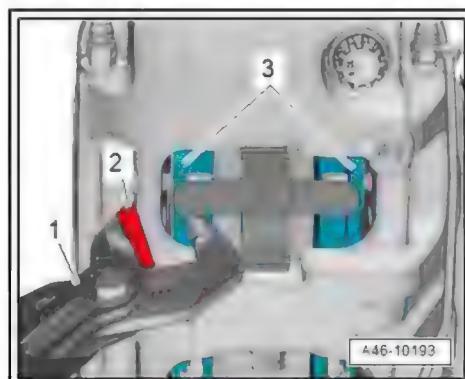


A46-10299



Note

To make it easier to detach the brake caliper from the brake disc, use suitable pliers -1- to press back the brake pads -3- slightly. To avoid damaging the paint on the caliper, insert a piece of rubber -2- between the caliper and the pliers.



A46-10193



- Remove bolts -1- and carefully pull brake caliper off brake disc with brake pads installed.



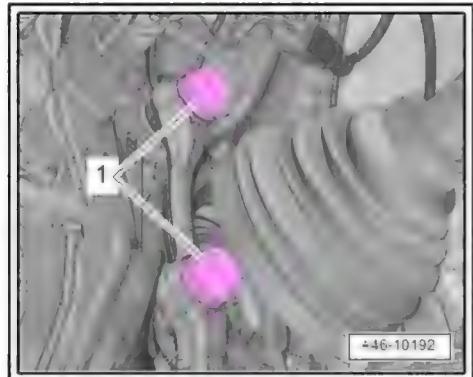
**Caution**

**Risk of damage to brake hose**

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*

**Risk of damage to brake caliper pistons**

- ◆ *Do not apply brake when brake caliper is removed.*



- Tie brake caliper to body with suitable wire.

**Installing**

Installation is carried out in reverse order; note the following:



**Note**

*Renew bolts for brake caliper after removal.*



**WARNING**

*Risk to health* With respect to the correctness of information in this document. Copyright by AUDI AG.

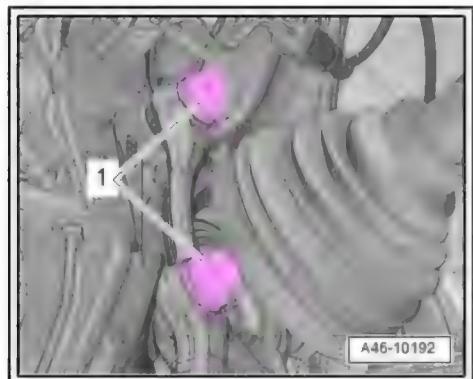
- ◆ *Do not blow out the brake system with compressed air.*



**Note**

*Use only methylated spirits to clean the brake caliper.*

- Clean brake caliper.
- Carefully fit brake caliper (with pads installed) over brake disc.
- Tighten new bolts -1-.



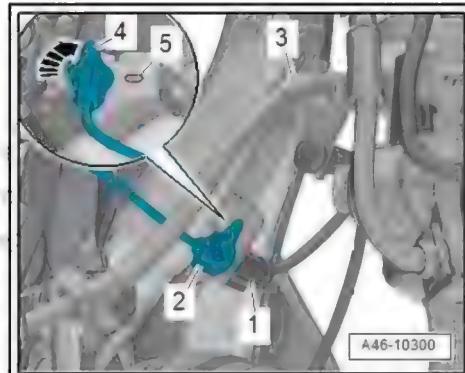
- Secure brake hose -3- at bracket.
- Locate electrical connector -2- in installation position and turn in direction of -arrow- until tab -4- engages in hole -5- in bracket.
- Plug in electrical connector -1-



Note

- ◆ Make sure the electrical connector and brake hose are positioned correctly.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.

- Fit front wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



#### WARNING

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

#### Tightening torques

- ◆ ⇒ [“1.1.8 Exploded view - front brakes, ceramic version \(1LN/1LW\)”, page 77](#)

### 1.4 Renewing brake caliper

- ⇒ [“1.4.1 Renewing brake caliper - steel version brakes \(1LA/1LJ/1LF/1LL/1LU\), ceramic brakes \(1LN/1LW\)”, page 124](#)
- ⇒ [“1.4.2 Renewing brake caliper \(1LP\)”, page 128](#)
- ⇒ [“1.4.3 Renewing brake caliper - steel version brakes \(1LM/1LX\)”, page 133](#)

#### 1.4.1 Renewing brake caliper - steel version brakes (1LA/1LJ/1LF/1LL/1LU), ceramic brakes (1LN/1LW)



Note

*In the following procedure the brake caliper is removed and disconnected from the hydraulic system. The brake hose is disconnected.*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332



W00-11165

- ◆ Brake pedal actuator - V.A.G 1869/2-

VAG 1869/2

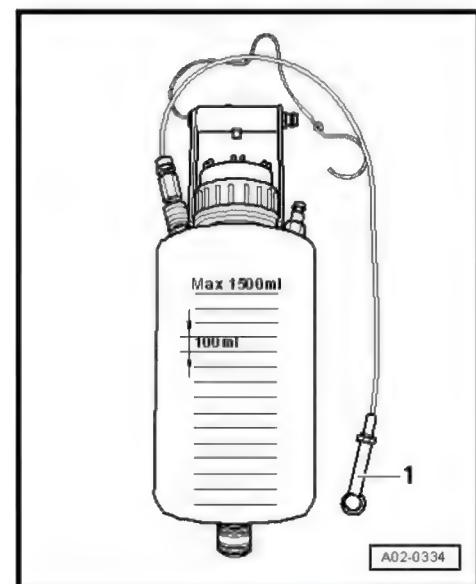


W00-11589

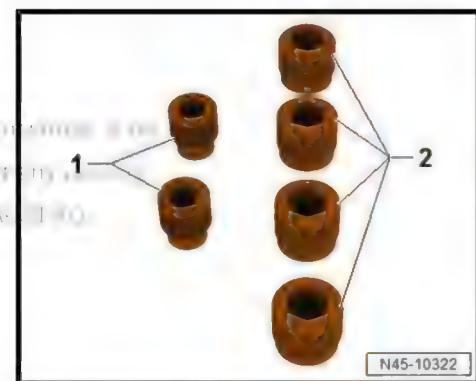
- ◆ Reservoir from brake filling and bleeding equipment - VAS 5234-



- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



A02-0334



N45-10322

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- 1 - M10 sealing plugs
- 2 - M12 sealing plugs

#### Removing

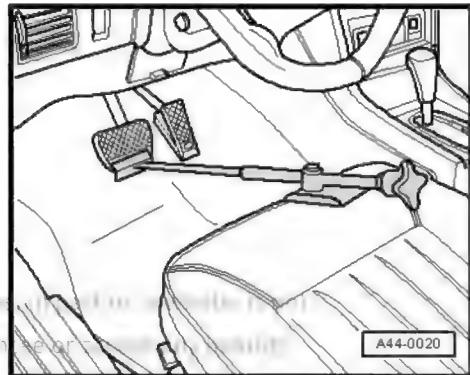
- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal at least 60 mm.



Note

*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*

- Remove front wheel ➔ Running gear, axles, steering; Rep. gr. p.44 ; Wheels, tyres .



A44-0020



Note

*Place a cloth under the connection to catch escaping brake fluid.*



#### WARNING

##### Risk of skin irritation

- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.

*Accident risk: if the water content in the brake fluid is too high, this can cause vapour bubbles in the fluid.*

- ◆ Brake fluid is hygroscopic, i.e. it absorbs moisture from the surrounding air.
- ◆ Seal open brake hoses and brake lines using sealing plugs from assembly parts set - 5Q0 698 311- .

*Risk of malfunction if brake fluid comes into contact with fluids containing mineral oils.*

- ◆ Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Protective gloves must be free of oil and grease.

*Risk of damage to paintwork surfaces*

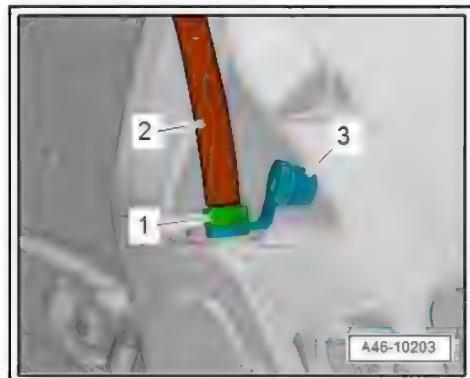
- ◆ Due to its corrosive effect, brake fluid must not be allowed to come into contact with paintwork. Rinse off brake fluid spillages immediately using plenty of water.

- Detach protective cap -3- from bleeder screw -1-.
- Fit bleeder hose -2- of reservoir onto bleeder screw.
- Open bleeder screw to relieve pressure in hydraulic system.
- Close bleeder screw and remove reservoir.



Note

*The brake pedal actuator - V.A.G 1869/2- must not be removed.*



A46-10203

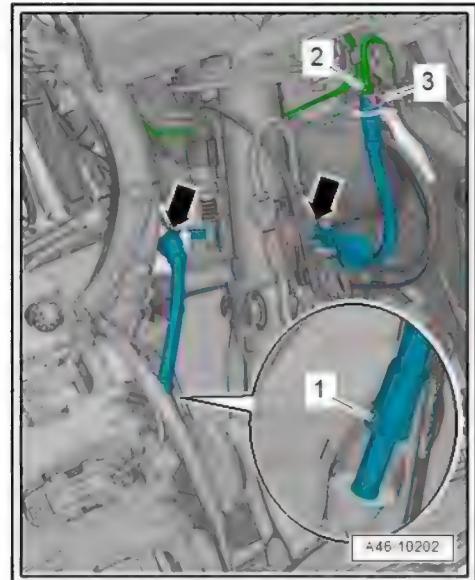
- Unscrew union screw -2-.
- Move brake hose clear at brackets -arrows-.
- Unscrew and disconnect brake hose -1- from brake caliper.



Note

*Disregard -item 3-.*

- Remove brake pads [⇒ page 79](#) .



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## Installing

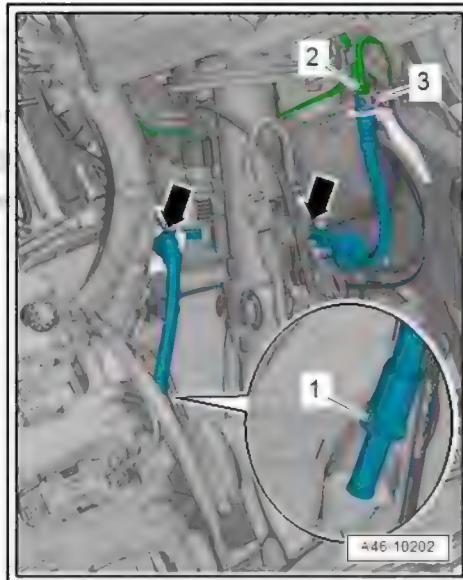
- Install brake pads [⇒ page 79](#).
- Attach brake hose -1- to caliper and tighten connection.
- Check retaining spring -3- for damage and renew if necessary.
- Insert brake hose into brackets -arrows- and connect to brake line: tighten union screw -2-.



### Note

- ◆ Make sure the brake hose is routed correctly.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.

- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system (only at wheel where caliper was detached and brake hose disconnected)  
⇒ "[6.2 Bleeding hydraulic system](#)", [page 273](#) .



### Note

- ◆ Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.
- ◆ Bleeder screw: 10 Nm



### Note

If the brake pedal still feels "soft", bleed the complete brake system ⇒ "[6.2 Bleeding hydraulic system](#)", [page 273](#) .



### Note

- ◆ Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.
- ◆ Bleeder screw: 10 Nm

- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



### WARNING

#### Risk of accident!

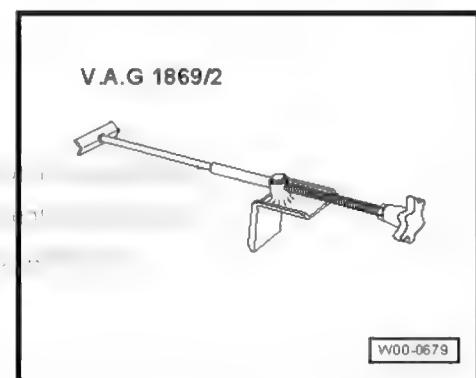
- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

## 1.4.2 Renewing brake caliper (1LP)

Special tools and workshop equipment required

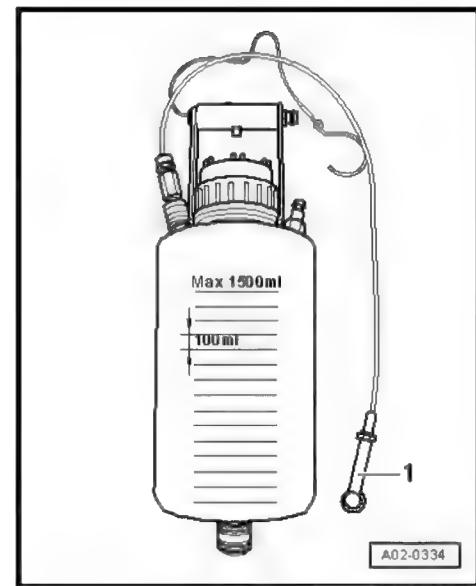
- ◆ Torque wrench - V.A.G 1332-

- ◆ Ratchet - V.A.G. 1332/1-
- ◆ Brake pedal actuator - V.A.G 1869/2-



VW00-0679

- ◆ Reservoir -1- from brake filling and bleeding equipment - VAS 5234-



A02-0334

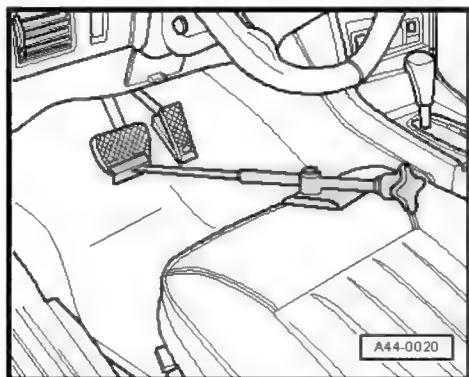
## Removing

- Remove relevant front wheel ⇒ Rep. gr. 44 ; Wheels and tyres .
- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal at least 60 mm.



### Note

*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*



- Connect hose of reservoir to bleeder screw on brake caliper (front).
- Open bleeder screw on front brake caliper to relieve pressure in brake system.



### WARNING

- ◆ *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*
- ◆ *If brake fluid comes into contact with skin, rinse with plenty of water.*
- ◆ *If you get brake fluid in your eyes, rinse your eyes out and consult a doctor.*
- ◆ *Do not drink alcohol or take drugs before or during work on the vehicle.*

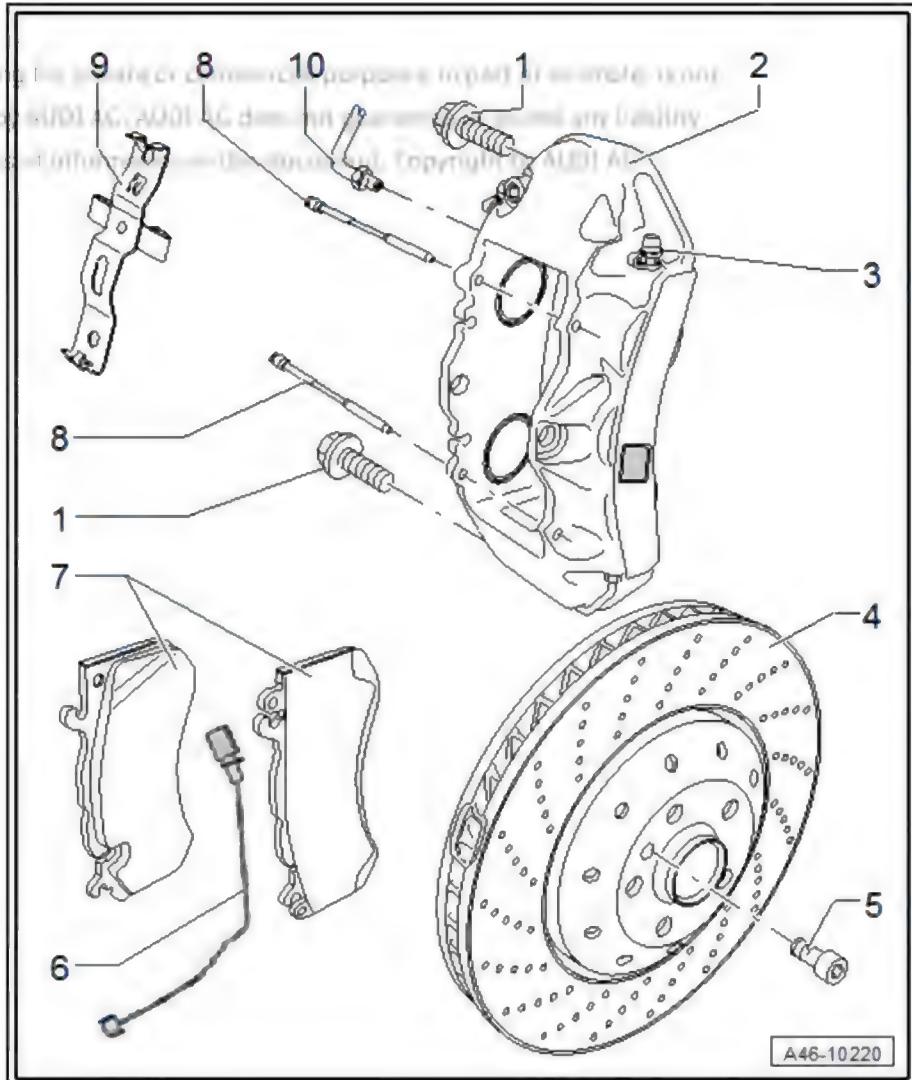
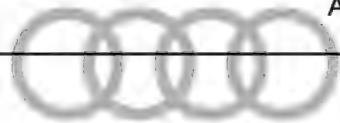
- Close bleeder screw (13 Nm).



### Note

*The brake pedal actuator - V.A.G 1869/2- must not be removed.*

- Remove brake pads.



- Disconnect brake hose -10-.
- Remove bolts -1-.
- Detach brake caliper -2-.

#### Installing

- Tightening torques



#### Note

*Use new bolts ⇒ Electronic parts catalogue .*

- Install brake caliper.
- Secure brake caliper using new bolts.
- Tightening torques
- Connect brake hose to brake caliper and tighten connection.



#### WARNING

- ◆ *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*
- ◆ *If brake fluid comes into contact with skin, rinse with plenty of water.*
- ◆ *If you get brake fluid in your eyes, rinse your eyes out and consult a doctor.*
- ◆

Brake hose must be seated in bracket.

- Clip in pad wear indicator wire.
- Install brake pads.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system (only at wheel where caliper was detached and brake hose disconnected)  
⇒ "[6.2 Bleeding hydraulic system](#)", page 273 .



#### Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*



#### Note

*If the brake pedal still feels "soft", bleed the complete brake system  
⇒ "[6.2 Bleeding hydraulic system](#)", page 273 .*



#### Note

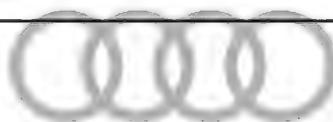
- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*



#### WARNING

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*



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### 1.4.3 Renewing brake caliper - steel version brakes (1LM/1LX)



#### Note

In the following procedure the brake caliper is removed and renewed. The brake hose is disconnected.

#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332



W00-11165

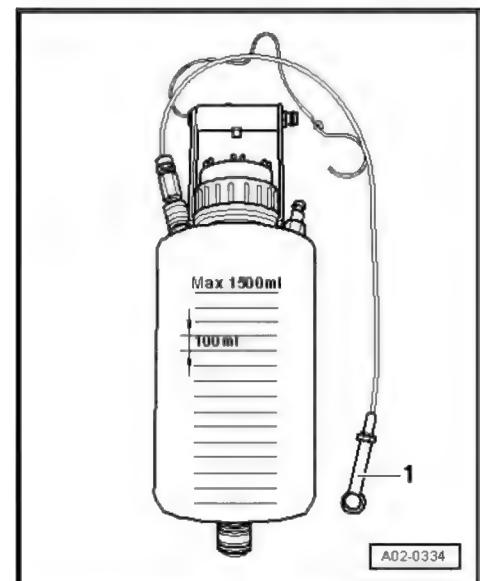
- ◆ Brake pedal actuator - V.A.G 1869/2-

VAG 1869/2



W00-11589

- ◆ Reservoir -1- from brake filling and bleeding equipment - VAS 5234-



A02-0334

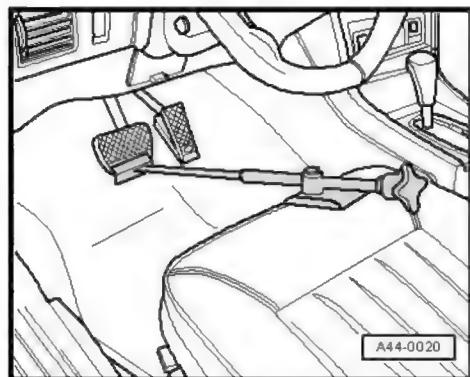
## Removing

- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal at least 60 mm.



Note

*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*



A44-0020

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



Note

*Place a cloth under the connection to catch escaping brake fluid.*



### WARNING

#### Risk of skin irritation

- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.

*Accident risk: if the water content in the brake fluid is too high, this can cause vapour bubbles in the fluid.*

- ◆ Brake fluid is hygroscopic, i.e. it absorbs moisture from the surrounding air.
- ◆ Seal open brake hoses and brake lines using sealing plugs from assembly parts set - 5Q0 698 311- .

*Risk of malfunction if brake fluid comes into contact with fluids containing mineral oils.*

- ◆ Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Protective gloves must be free of oil and grease.

*Risk of damage to paintwork surfaces*

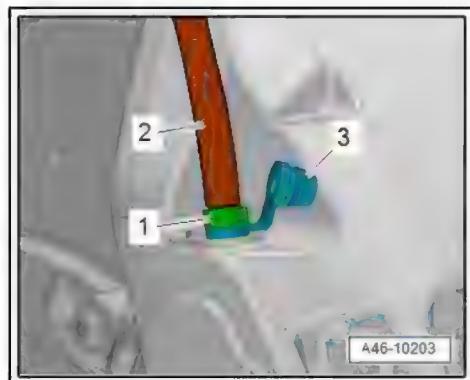
- ◆ Due to its corrosive effect, brake fluid must not be allowed to come into contact with paintwork. Rinse off brake fluid spillages immediately using plenty of water.

- Detach protective cap -3- from bleeder screw -1-.
- Fit bleeder hose -2- of reservoir onto bleeder screw.
- Open bleeder screw to relieve pressure in hydraulic system.
- Close bleeder screw and remove reservoir.



Note

*The brake pedal actuator - V.A.G 1869/2- must not be removed.*



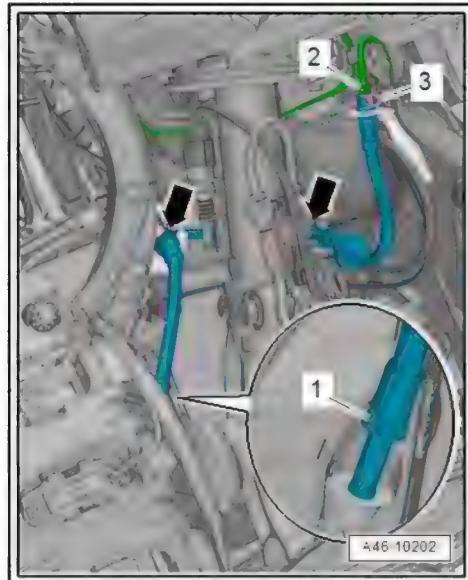
A46-10203

- Unscrew union screw -2-.
- Move brake hose clear at brackets -arrows-.
- Unscrew and disconnect brake hose -1- from brake caliper.



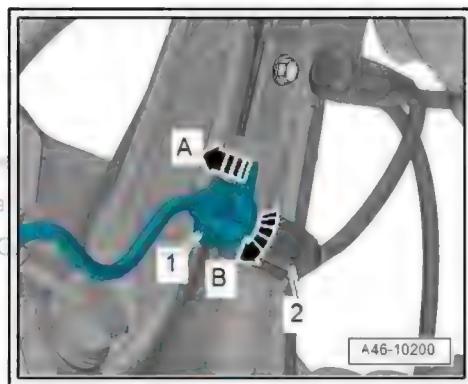
Note

*Disregard -item 3-.*



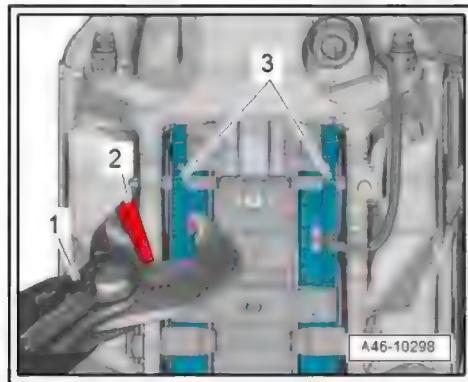
- Unplug electrical connector -2- for brake pad wear indicator.
- Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.

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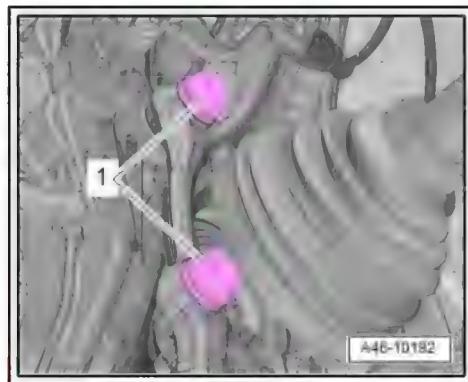


Note

*To make it easier to detach the brake caliper from the brake disc,  
use suitable pliers -1- to press the brake pads -3- slightly back  
into the caliper. To avoid damaging the paint on the caliper, insert  
a piece of rubber -2- between the caliper and the pliers.*



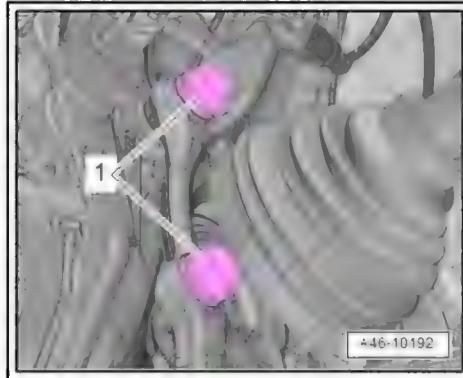
- Remove bolts -1- and carefully pull brake caliper off brake disc with brake pads installed.
- Remove brake pads if necessary [⇒ page 97](#).



## Installing

Installation is carried out in reverse order; note the following:

- Locate brake caliper in installation position and tighten new bolts -1-.
- Install brake pads [⇒ page 97](#).

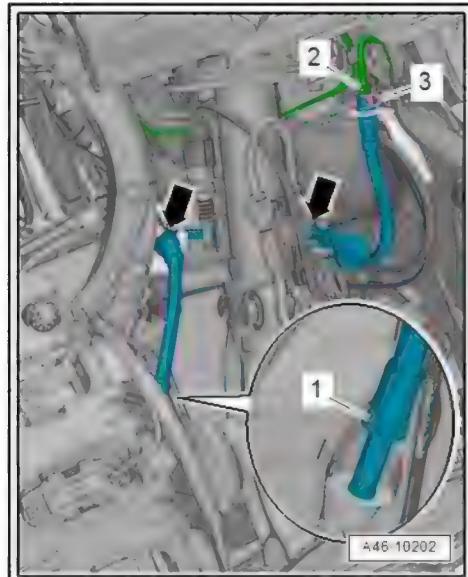


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- Attach brake hose -1- to caliper and tighten connection.
- Check retaining spring -3- for damage and renew if necessary.
- Insert brake hose into brackets -arrows- and connect to brake line; tighten union screw -2-.

**i Note**

- ◆ *Make sure the brake hose is routed correctly.*
- ◆ *The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.*
- Remove brake pedal actuator - V.A.G 1869/2- .
- Bleed brake system (only at wheel where caliper was detached and brake hose disconnected)  
 ⇒ ["6.2 Bleeding hydraulic system", page 273](#) .



**i Note**

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*

**i Note**

*If the brake pedal still feels "soft", bleed the complete brake system* ⇒ ["6.2 Bleeding hydraulic system", page 273](#) .

**i Note**

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ;  
 Wheels, tyres .

**WARNING**

**Risk of accident!**

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

**Tightening torques**

- ◆ ⇒ ["1.1.7 Exploded view - front brakes, steel version \(1LM/1LX\)", page 74](#)

## 1.5 Removing and installing brake disc

⇒ “1.5.1 Removing and installing brake disc - steel version brakes (1LA/1LJ/1LF/1LL/1LU/1LM/1LX)”, page 138

⇒ “1.5.2 Removing and installing brake disc (1LP)”, page 139

⇒ “1.5.3 Removing and installing brake disc - ceramic brakes (1LN/1LW)”, page 140

### 1.5.1 Removing and installing brake disc - steel version brakes (1LA/1LJ/1LF/1LL/1LU/1LM/1LX)

#### Removing

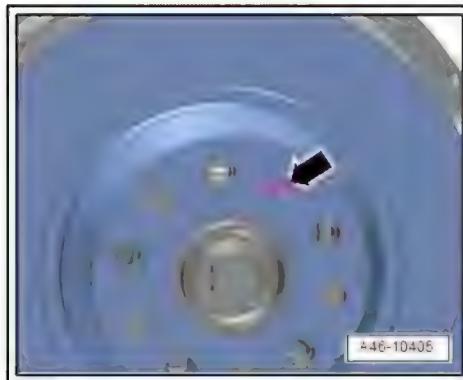
- Remove relevant brake caliper with brake carrier  
⇒ [page 108](#).
- Loosen bolt -1- and take off brake disc.



#### Caution

##### *Risk of damage to brake discs*

- ◆ *Do not force brake disc off wheel hub. Use rust remover if necessary.*



#### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage before reinstalling:
- ◆ Wear limit of brake discs ⇒ [page 6](#)



#### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

- Clean contact surface of brake disc and wheel hub thoroughly and remove corrosion.
- Fit brake disc onto wheel hub.



#### Note

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*Take care to keep the brake disc straight when fitting it on the wheel hub.*

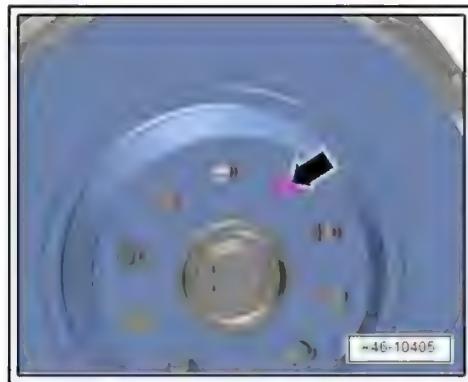
- Tighten bolt -arrow-.
- Install brake caliper [page 108](#).



#### WARNING

*Risk of accident!*

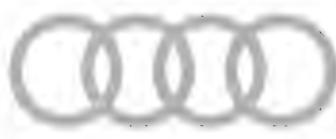
- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



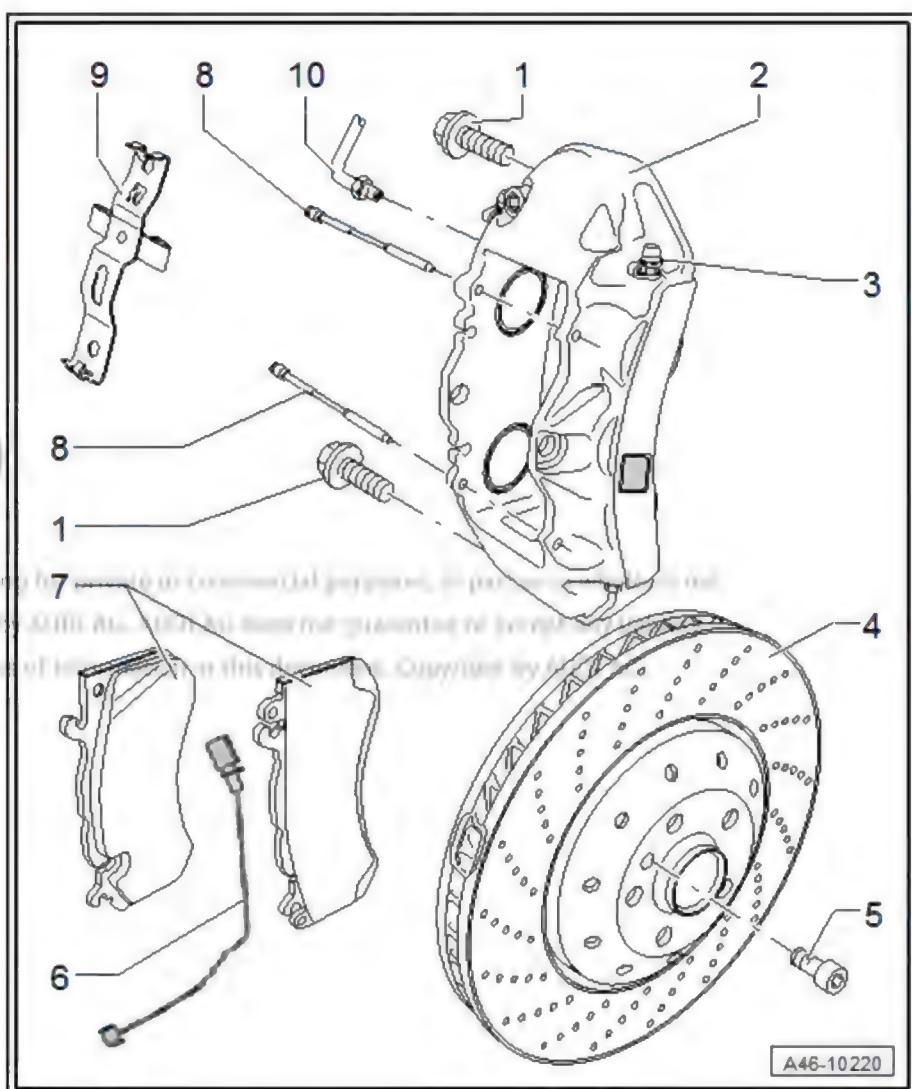
Tightening torques

- ◆ [⇒ “1.1 Exploded view - front brakes”, page 60](#)

### 1.5.2 Removing and installing brake disc (1LP)



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#### Removing

- Remove brake caliper.

- Remove locating bolt -5- from brake disc, holding brake disc in position.
- Take brake disc off wheel hub.



Note

*Take care to keep the brake disc straight when taking it off the wheel hub.*

#### Installing

- Tightening torques
- Clean contact surfaces of wheel hub and brake disc and remove corrosion.
- Fit brake disc onto wheel hub.



Note

*Take care to keep the brake disc straight when fitting it onto the wheel hub.*

- Screw in locating bolt -5- and tighten.
- Install brake caliper.



#### WARNING

##### *Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

### 1.5.3 Removing and installing brake disc - ceramic brakes (1LN/1LW)

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



V.A.G 1331

W00-11166

#### Removing

- Remove relevant brake caliper [⇒ page 121](#).



### Caution

*Risk of irreparable damage to ceramic brake disc*

- ◆ Take care not to drop brake disc.
- ◆ Do not use a hammer to remove brake disc from wheel hub.
- ◆ Do not attempt to release brake disc from hub with any kind of lever.

- Remove bolt -1- and take off brake disc by hand; do not use tools.

If the brake disc is difficult to remove, proceed as follows:

- Screw two M8 bolts -arrows- into threaded holes in brake disc until they make contact.
- Continue to screw in bolts alternately,  $\frac{1}{2}$  a turn at a time, so that brake disc comes off wheel hub.

### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage:
  - ◆ Cracks in the bolted joint area [⇒ page 12](#)
  - ◆ Edge fractures [⇒ page 13](#)
  - ◆ Chipping [⇒ page 13](#)
  - ◆ Cracks extending into cooling channels [⇒ page 14](#)
  - ◆ Assessing degree of wear [⇒ page 14](#)



### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*



*When fitting the brake discs, note the direction of rotation (marked with an arrow) and install accordingly on the left or right side of the vehicle.*

- Thoroughly clean contact surface of brake disc and wheel hub.
- Fit brake disc onto wheel hub.



*Take care to keep the brake disc straight when fitting it on the wheel hub.*

- Tighten bolt -1-.

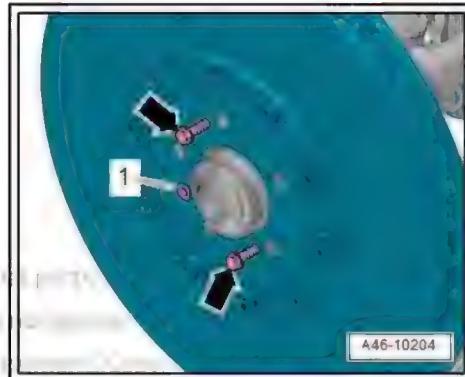
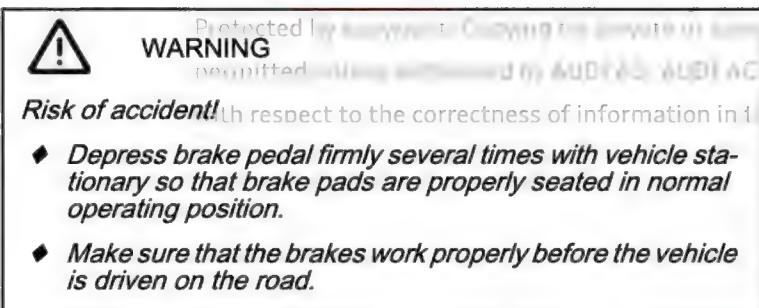


Note



*Disregard -arrows-*

- Install brake caliper [⇒ page 121](#).



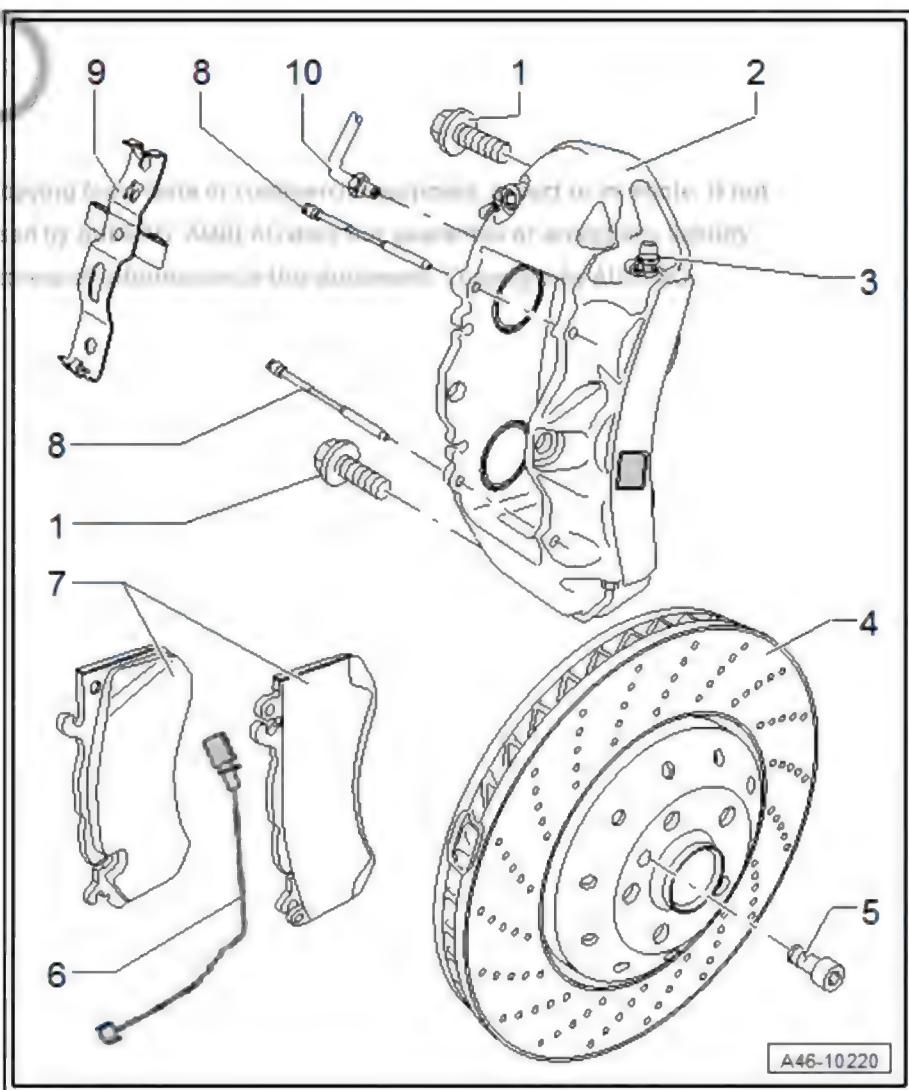
#### Tightening torques

- ⇒ ["1.1.8 Exploded view - front brakes, ceramic version \(1LN/1LW\)", page 77](#)

## 1.6 Renew brake disc



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### Removing

- Remove brake caliper -2-.
- Remove locating bolt -5- from brake disc -4-. Hold brake disc in position while doing so.
- Take brake disc off wheel hub.



#### Note

*Take care to keep the brake disc straight when taking it off the wheel hub.*

### Installing

- Tightening torques



#### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

- Clean contact surfaces of wheel hub and remove corrosion.

- Fit brake disc onto wheel hub.



Note

*Take care to keep the brake disc straight when fitting it onto the wheel hub.*

- Screw in locating bolt -5- and tighten.
- Install brake caliper -2-.



**WARNING**

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

## 1.7 Removing and installing splash plate

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



V.A.G 1331



W00-11166

### Removing

- Remove brake disc [page 138](#).

- Remove bolts -arrows- and detach splash plate -1-.



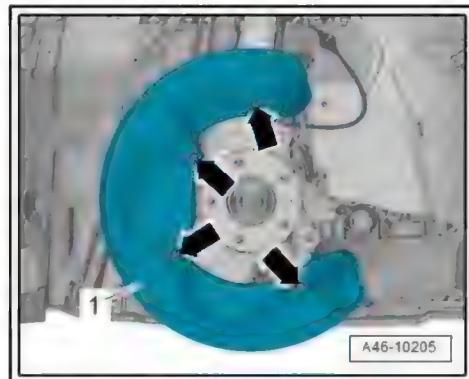
## Note

*The splash plate is shown on a vehicle with ceramic brakes as an example.*

## Installing

Installation is carried out in reverse order; note the following:

- Clean splash plate and wheel hub.
- Install brake disc  $\Rightarrow$  page 138 .



## **WARNING**

### *Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

#### Tightening torques

- ◆ ⇒ “1.1 Exploded view - front brakes”, page 60

## 1.8 Removing and installing pad wear indicator wire

⇒ “1.8.1 Removing and installing pad wear indicator wire - steel version brakes (1LA / 1LJ)”, page 145

⇒ “**1.8.2 Removing and installing pad wear indicator wire - steel version brakes (1LF / 1LL)**”, page 146

⇒ “1.8.3 Removing and installing pad wear indicator wire - steel version brakes (1LU)”, page 148

⇒ “**1.8.4 Removing and installing pad wear indicator wire - steel version brakes (1LM / 1LX)**”, page 149

⇒ "1.8.5 Removing and installing pad wear indicator wire - ceramic brakes (1LN / 1LW)", page 150

### **1.8.1 Removing and installing pad wear indicator wire - steel version brakes (1LA / 1LJ)**

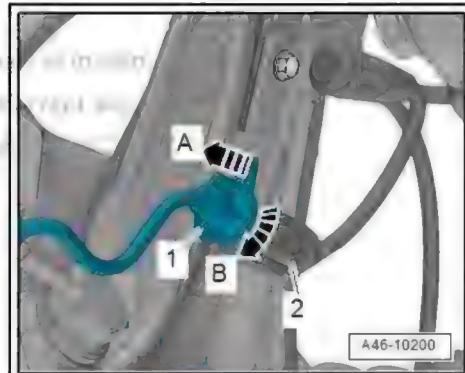
## Removing

- Remove front wheel  $\Rightarrow$  Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



- Unplug electrical connector -2- for brake pad wear indicator.

**Pro** Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.

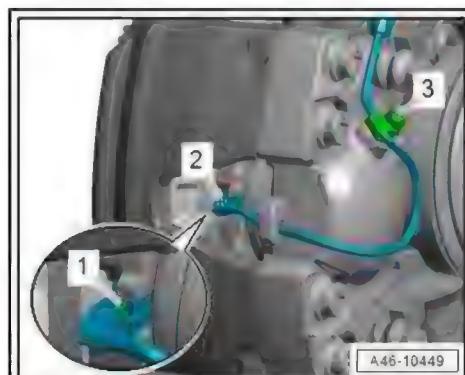


- Open dust cap -3-, move clear electrical wiring for pad wear sender and disengage wiring from brake caliper.
- Pull contact -1- for pad wear sender out of brake pad, paying attention to retaining clip -2-.



#### Note

*The pad wear sender must be renewed if the retaining clip -2- is lost.*



#### Installing

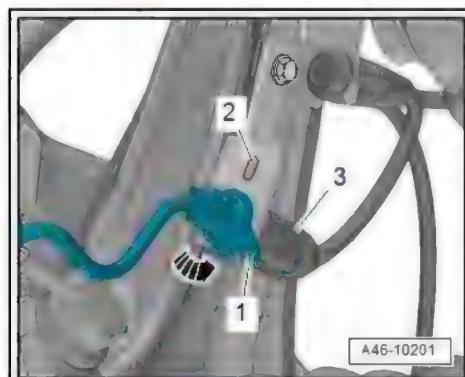
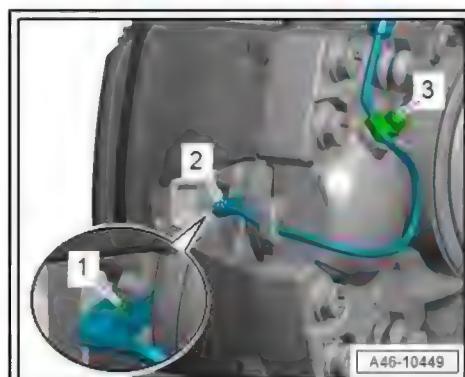
- Insert contact -1- for pad wear sender with retaining clip -2- into brake pad so that it engages.



#### Note

*Make sure the contact for the pad wear sender is properly seated in the brake pad.*

- Secure electrical wire for pad wear sender with dust cap -3- and engage at brake caliper, as shown in illustration.
- Locate electrical connector in correct position and turn in direction of -arrow- until tab -1- engages in slot -2- in bracket.
- Plug in electrical connector -3-.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .

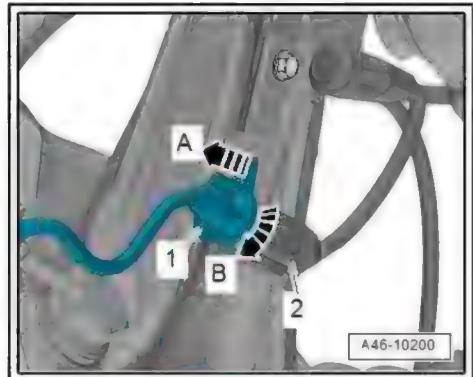


## 1.8.2 Removing and installing pad wear indicator wire - steel version brakes (1LF / 1LL)

#### Removing

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .

- Unplug electrical connector -2- for pad wear sender.
- Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.



- Pull contact -1- for pad wear sender out of brake pad, paying attention to retaining clip -2-.
- Move electrical wiring clear at brake hose -3- and retainer -4-.



#### Note

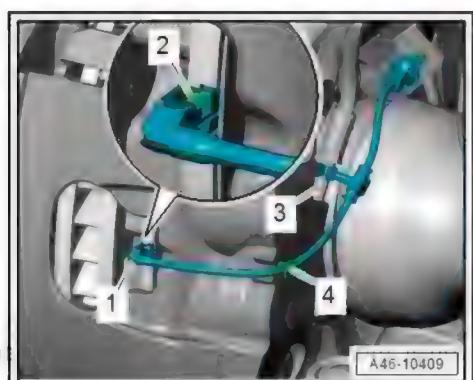


*The pad wear sender must be renewed if the retaining clip -2- is lost.*

#### Installing

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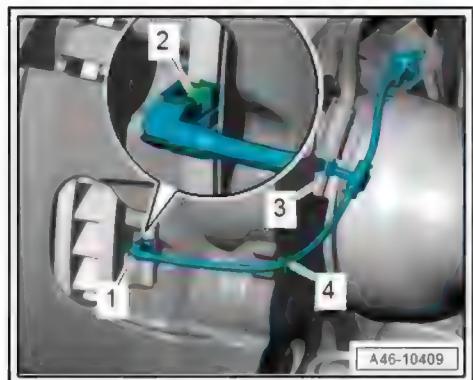
Installation is carried out in reverse order; note the following:



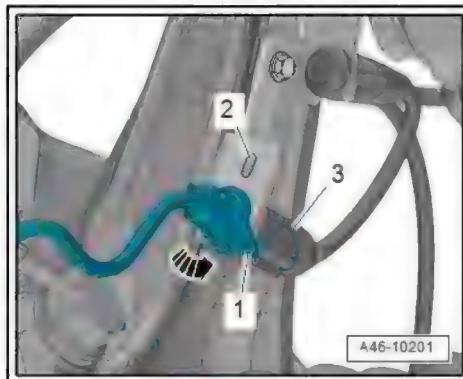
#### Note

- ◆ Check for damage to contact for pad wear sender and renew if necessary.
- ◆ Make sure the contact for the pad wear sender is properly seated in the brake pad.

- Press contact -1- for pad wear sender with retaining clip -2- into inner brake pad so that it engages.
- Secure electrical wiring at retainer -4- and brake hose -3-.



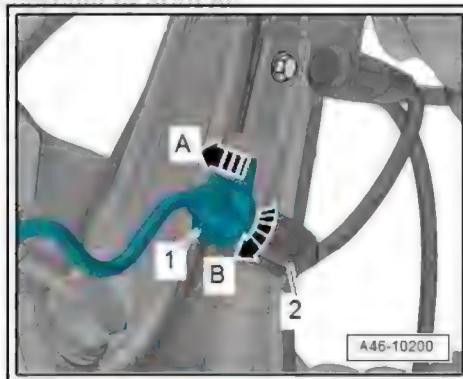
- Locate electrical connector in correct position and turn in direction of -arrow- until tab -1- engages in slot -2- in bracket.
- Plug in electrical connector -3-.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



### 1.8.3 Removing and installing pad wear indicator wire - steel version brakes (1LU)

#### Removing

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unplug electrical connector -2- for brake pad wear indicator.
- Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.

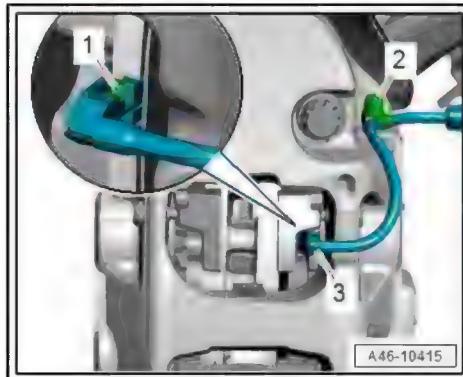


- Open dust cap -2- and move clear electrical connector for pad wear sender.
- Pull contact -3- for pad wear sender out of brake pad, paying attention to retaining clip -1-.



Note

*The pad wear sender must be renewed if the retaining clip -1- is lost.*



#### Installing

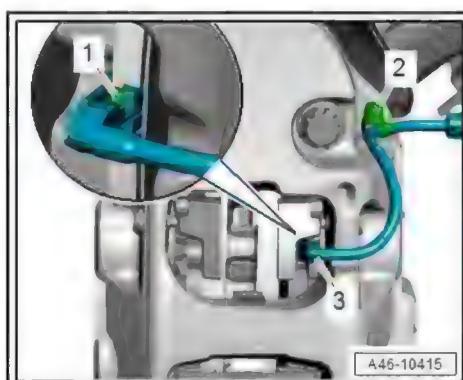
- Insert contact -3- of pad wear sender into brake pad so that it engages.



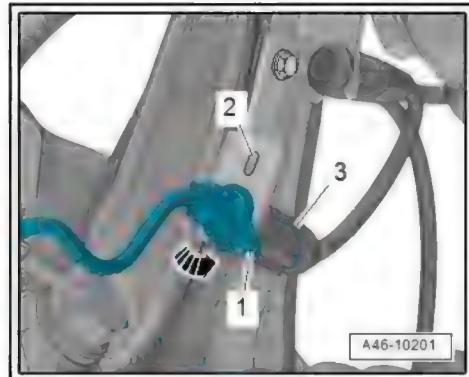
Note

*Make sure the contact for the pad wear sender is properly seated in the brake pad.*

- Secure electrical wire for pad wear sender with dust cap -2- as shown in illustration.



- Locate electrical connector in correct position and turn in direction of -arrow- until tab -1- engages in slot -2- in bracket.
- Plug in electrical connector -3-.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



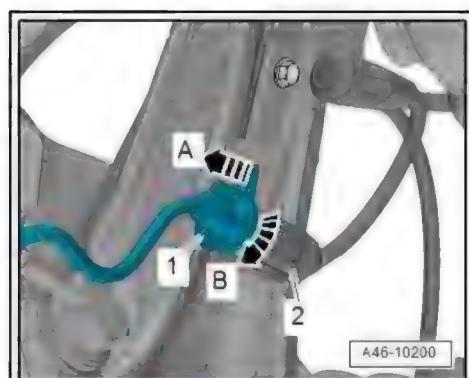
#### 1.8.4 Removing and installing pad wear indicator wire - steel version brakes (1LM / 1LX)



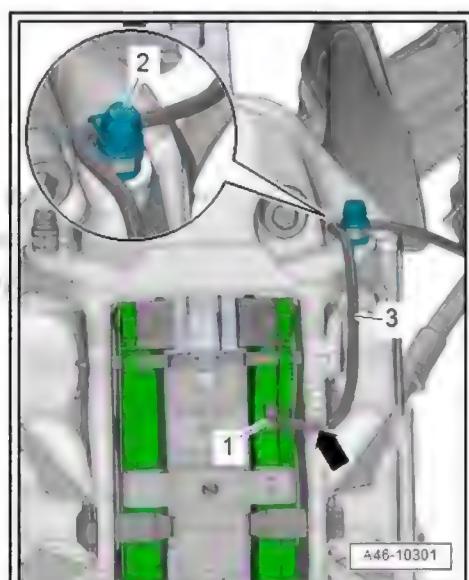
*The brake pad wear sender cannot be removed without damage.*

##### Removing

- Remove front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unplug electrical connector -2- for pad wear sender.
- Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.



- Move clear electrical wire -3- for pad wear sender: to do so, open dust cap -2- and unclip wire at brake caliper -arrow-.
- Detach contact -1- of pad wear sender from brake pad using pliers.



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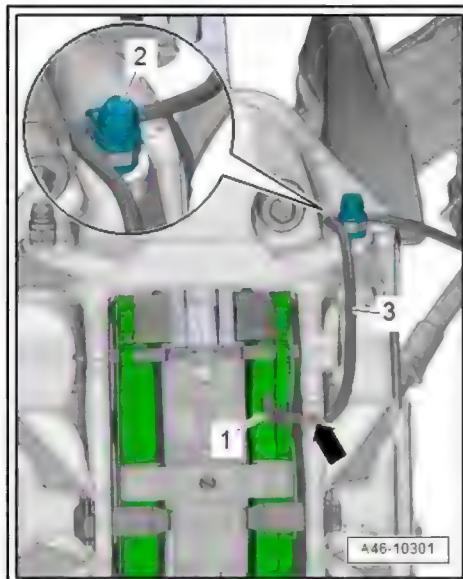
## Installing

- Insert contact -1- of pad wear sender into brake pad so that it engages.

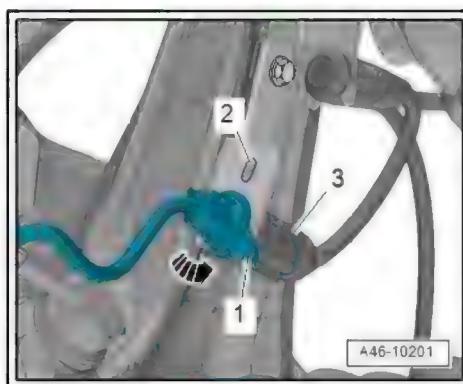


*Make sure the contact for the pad wear sender is properly seated in the brake pad.*

- Secure electrical wire -3- for pad wear sender: to do so insert wire into brake caliper -arrow- and secure with dust cap -2- as shown in illustration.



- Locate electrical connector in installation position and turn in direction of -arrow- until tab -1- engages in hole -2- in bracket.
- Plug in electrical connector -3-.
- Fit front wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



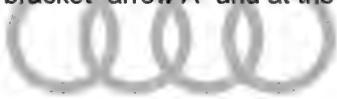
## 1.8.5 Removing and installing pad wear indicator wire - ceramic brakes (1LN / 1LW)



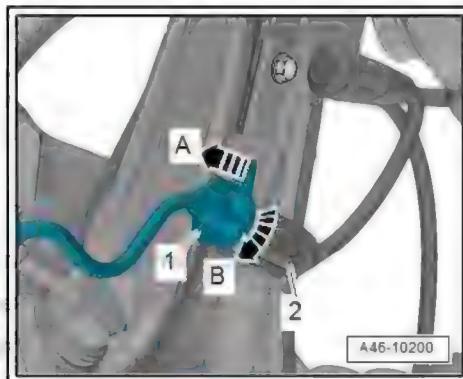
*The brake pad wear sender cannot be removed without damage.*

### Removing

- Remove front wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Unplug electrical connector -2- for brake pad wear indicator.
- Release electrical connector -1- for pad wear sender from bracket -arrow A- and at the same time turn 90° -arrow B-.



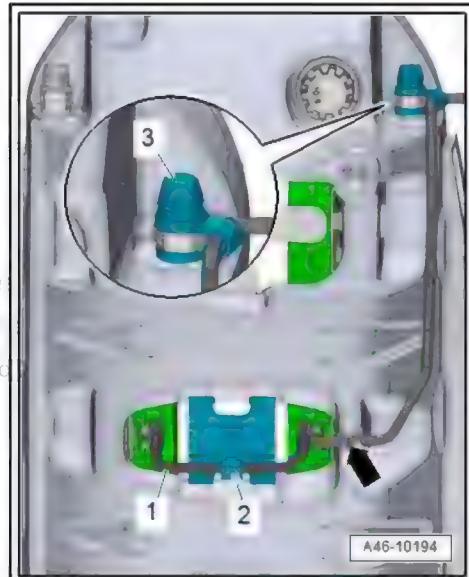
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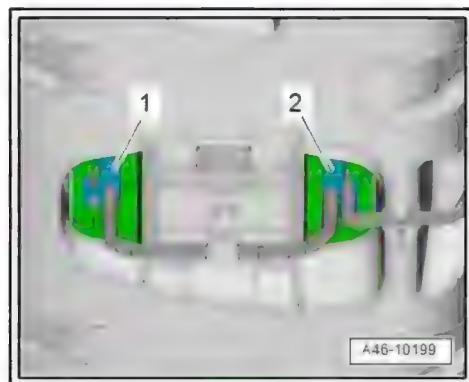
- Move clear electrical wire -1- for pad wear sender: to do so, open dust cap -3- and guide wire out of bracket -2- and brake caliper -arrow-.



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- Detach contacts -1 and 2- of pad wear sender from brake pads using pliers.



#### Installing

- Insert contacts -1 and 2- of pad wear sender into brake pads so that they engage.
- The free wire connection faces towards the inside of the vehicle.



#### Note

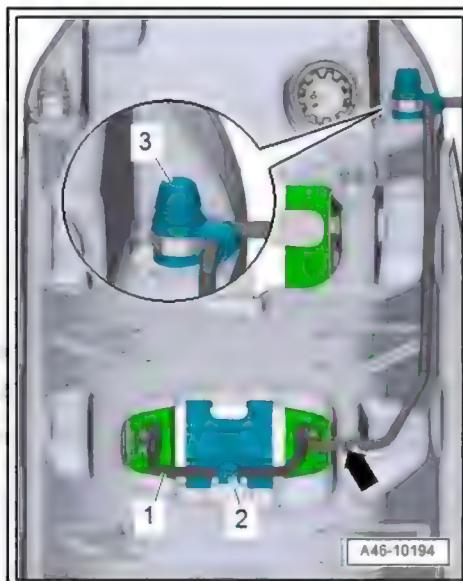
*Make sure the contacts for the pad wear sender are properly seated in the brake pads.*



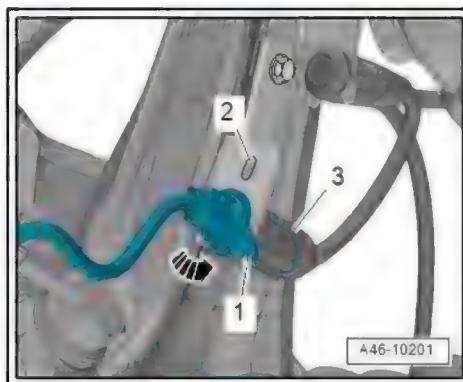
- Secure electrical wire -1- for pad wear sender: to do so insert wire into bracket -2- and brake caliper -arrow- and secure with dust cap -3- as shown in illustration.



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- Locate electrical connector in installation position and turn in direction of -arrow- until tab -1- engages in hole -2- in bracket.
- Plug in electrical connector -3-.
- Fit front wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



## 2 Rear brakes

- ⇒ "2.1 Exploded view - rear brakes", page 153
- ⇒ "2.2 Removing and installing brake pads", page 159
- ⇒ "2.3 Removing and installing brake caliper", page 171
- ⇒ "2.4 Renewing brake caliper", page 179
- ⇒ "2.5 Removing and installing brake disc", page 189
- ⇒ "2.6 Removing and installing splash plate", page 193

### 2.1 Exploded view - rear brakes

- ⇒ "2.1.1 Exploded view - rear brakes, steel version", page 153
- ⇒ "2.1.2 Exploded view - rear brakes, ceramic version",  
page 157

#### 2.1.1 Exploded view - rear brakes, steel ver- sion



Note

*Applies to all steel version rear brakes.*



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**1 - Electromechanical parking brake motor**

- Left parking brake motor - V282- , right parking brake motor - V283-
- Removing and installing parking brake motor - V282- / -V283-  
[⇒ page 200](#)
- Removing and installing control unit for electro-mechanical parking brake - J540-  
[⇒ page 199](#)

**2 - Bolts**

- 12 Nm

**3 - Brake pad wear sender**

- Rear left brake pad wear sender - G36- / rear right brake pad wear sender - G37-
- For inner brake pad
- Renew if damaged
- Cannot be removed without damage
- Removing and installing  
[⇒ page 194](#)

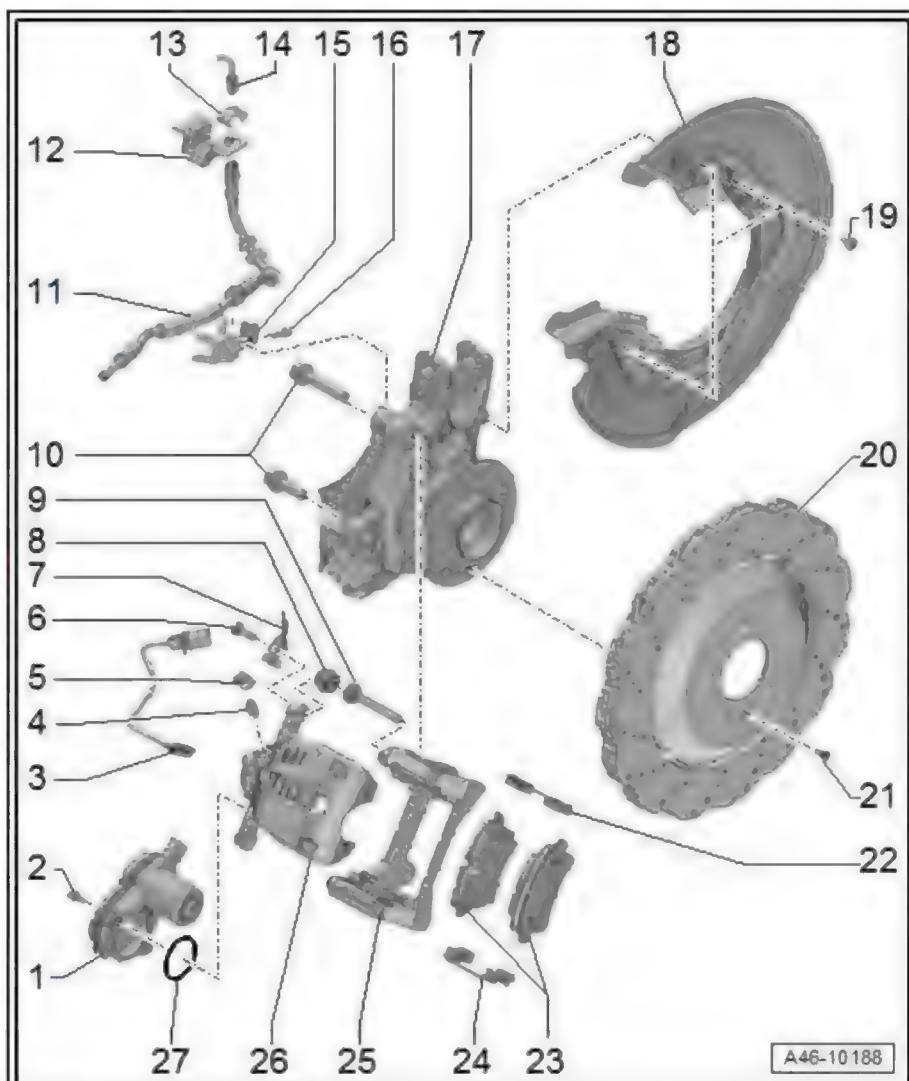
**4 - Bleeder screw**

- Bleed brake system  
[⇒ page 273](#).
- 10 Nm



Bleed at each bleeder screw. If  
 brake caliper has two bleeder  
 screws, first bleed at inner screw.

A46-10188



**5 - Protective cap**

**6 - Bolt**

- Self-locking
- Renew after removing
- Counter-hold guide pin when loosening and tightening
- 35 Nm

**7 - Bracket**

- For electrical connector

**8 - Protective sleeve**

- For guide pin
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.

**9 - Guide pin** Copyright. Copying for personal study only.

- Check for ease of movement
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.

10 - Bolt

- With washer
- Note different lengths; longer bolt is fitted at top
- Renew after removing
- 100 Nm +90°

11 - Brake hose

- Make sure the brake hose is routed correctly. The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- Renew if damaged
- Ensure that lugs are properly seated in grooves in bracket
- Tightening torque, brake hose to brake caliper: 20 Nm

12 - Bracket

- For brake hose
- Welded to body

13 - Retaining spring

- Renew if damaged

14 - Brake line

- Tightening torque, brake line to brake hose: 14 Nm

15 - Bracket

- For brake hose and electrical wiring

16 - Bolt

- 9 Nm

17 - Hub carrier

18 - Splash plate for brakes

- Removing and installing ⇒ [page 193](#)

19 - Bolt

- 10 Nm

20 - Brake disc

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Wear limit ⇒ [page 6](#)
- Removing and installing ⇒ [page 189](#)



**WARNING**

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

21 - Bolt

- 10 Nm

22 - Pad retaining spring

- Renew when changing pads
- Ensure correct positioning in brake carrier

23 - Brake pads

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Check pad thickness; wear limit ⇒ Maintenance ; Booklet 411
- Always renew on both sides of one axle

- Removing and installing [page 159](#)
- Note correct installation position:
  - ◆ Marking "BA" = outer pad
  - ◆ Marking "BI" = inner pad, with retainer for pad wear indicator

#### 24 - Pad retaining spring

- Renew when changing pads
- Ensure correct positioning in brake carrier

#### 25 - Brake carrier

- Replacement carriers are supplied assembled and with sufficient grease on guide pins
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.

#### 26 - Brake caliper

- Removing and installing [page 171](#)
- Renewing [page 179](#)
- Servicing [page 228](#)



#### 27 - O-ring

- Renew after removing

## 2.1.2 Exploded view - rear brakes, ceramic version

### 1 - Electromechanical parking brake motor

- Left parking brake motor - V282- , right parking brake motor - V283-
- Removing and installing parking brake motor - V282- / -V283-  
[⇒ page 200](#)
- Removing and installing control unit for electro-mechanical parking brake - J540-  
[⇒ page 199](#)

### 2 - Bolts

- 12 Nm

### 3 - Bracket

- For electrical wire for pad wear sender

### 4 - Brake pad wear sender

- Rear left brake pad wear sender - G36- / rear right brake pad wear sender - G37-
- Renew if damaged
- Cannot be removed without damage
- Removing and installing  
[⇒ page 195](#)

### 5 - Bleeder screw

- Bleed brake system  
[⇒ page 273](#).
- 10 Nm



#### Note

Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.

### 6 - Protective cap

### 7 - Bolt

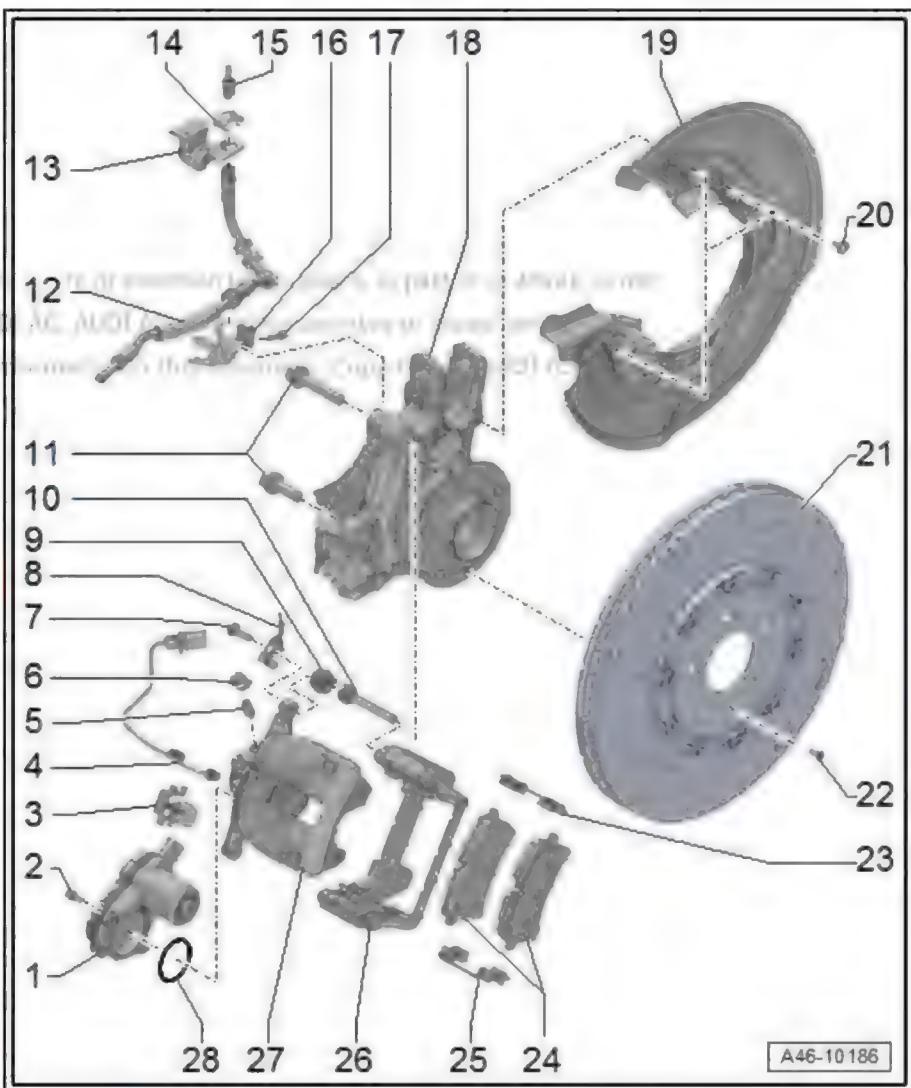
- Self-locking
- Renew after removing
- Counter-hold guide pin when loosening and tightening
- 35 Nm

### 8 - Bracket

- For electrical connector

### 9 - Protective sleeve

- For guide pin
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.



10 - Guide pin

- Check for ease of movement
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.

11 - Bolt

- With washer
- Note different lengths; longer bolt is fitted at top
- Renew after removing
- 100 Nm +90°

12 - Brake hose

- Make sure the brake hose is routed correctly. The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- Renew if damaged
- Ensure that lugs are properly seated in grooves in bracket
- Tightening torque, brake hose to brake caliper: 20 Nm

13 - Bracket

- For brake hose
- Welded to body

14 - Retaining spring

- Renew if damaged

15 - Brake line

- Tightening torque, brake line to brake hose: 14 Nm

16 - Bracket

- For brake hose and electrical wiring

17 - Bolt

- 9 Nm

18 - Hub carrier

19 - Splash plate for brakes

- Removing and installing ⇒ [page 193](#)

20 - Bolt

- 10 Nm

21 - Brake disc

- For correct version refer to ⇒ Electronic parts catalogue "ETKA"

- Assessing degree of wear ⇒ [page 14](#)

- Also check for:

- ◆ Cracks in the bolted joint area ⇒ [page 12](#)
- ◆ Edge fractures ⇒ [page 13](#)
- ◆ Chipping ⇒ [page 13](#)
- ◆ Cracks extending into cooling channels ⇒ [page 14](#)
- ◆ Assessing degree of wear ⇒ [page 14](#)
- Removing and installing ⇒ [page 191](#)



**WARNING**

If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.

**22 - Bolt**

- 10 Nm

**23 - Pad retaining spring**

- Renew when changing pads
- Ensure correct positioning in brake carrier

**24 - Brake pads**

- Check pad thickness; wear limit ⇒ Maintenance ; Booklet 411
- Always renew on both sides of one axle
- For correct version refer to ⇒ Electronic parts catalogue "ETKA"
- Removing and installing ⇒ [page 165](#)

**25 - Pad retaining spring**

- Renew when changing pads
- Ensure correct positioning in brake carrier

**26 - Brake carrier**

- Replacement carriers are supplied assembled and with sufficient grease on guide pins
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate guide pins.

**27 - Brake caliper**

- Removing and installing ⇒ [page 174](#)
- Renewing ⇒ [page 184](#)
- Servicing ⇒ [page 228](#)

**28 - O-ring**

- Renew after removing

## 2.2 Removing and installing brake pads

⇒ "2.2.1 Removing and installing brake pads - steel version brakes", page 159

⇒ "2.2.2 Removing and installing brake pads - ceramic brakes", page 165

### 2.2.1 Removing and installing brake pads - steel version brakes

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester

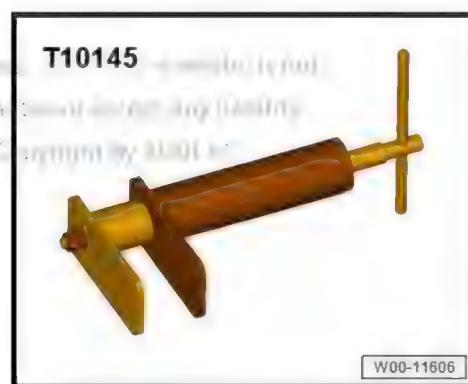
◆ Torque wrench - V.A.G 1331-



W00-11166

◆ Piston resetting appliance - T10145-

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W00-11606

Removing

- Release parking brake.
- Switch off ignition.



Note

- ◆ *Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.*
- ◆ *Do not unplug electrical connectors of parking brake motors.*
- Remove rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



Note

*The parking brake pistons must be moved back with the vehicle diagnostic tester if the brake pads are being renewed.*

- With ignition switched off, connect vehicle diagnostic tester to diagnostic connection in vehicle.
- Switch on ignition.
- After entering vehicle identification data, select **Guided Functions** mode.
- Move parking brake motors back:

#### Running gear/brake system

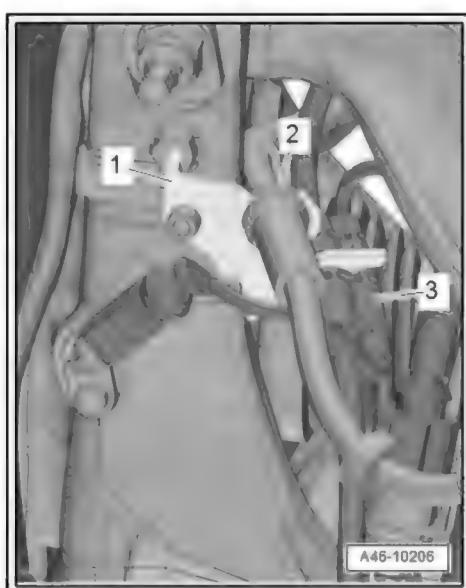
##### 01 Self-diagnosis compatible systems

53 Control unit for electromechanical parking brake  
J540

53 Functions - electromechanical parking brake

53 46 Removing brake pads

- Continue to follow the instructions on the vehicle diagnostic tester display.
- Slide connector for electromechanical parking brake out of retainer.
- Move clear brake hose -2- and wiring harness -3- at bracket -1-.

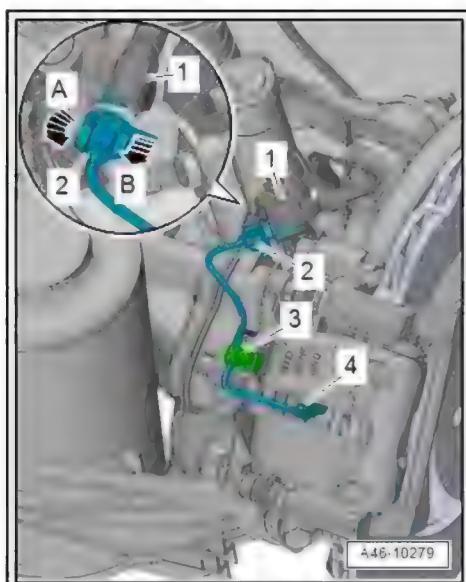


- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow B- and at the same time turn 90° -arrow A-.
- Detach dust cap -3- from bleeder screw and move electrical wiring clear.



Note

*Disregard -item 4-*



- Counterhold guide pins -1 and 2- and remove bolts -arrows-.
- Detach brake caliper (guide out electrical wire for pad wear sender).



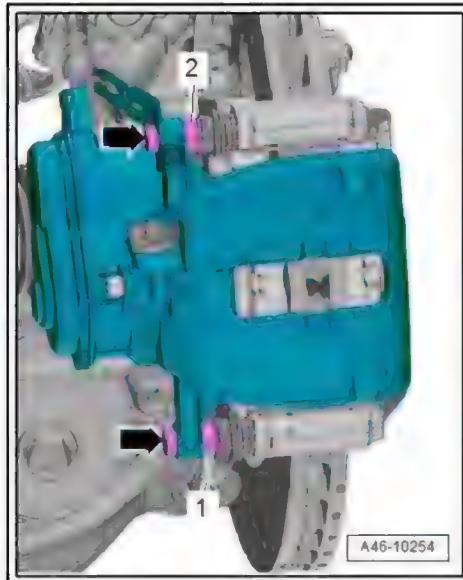
#### Caution

##### Risk of damage to brake hose

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*

##### Risk of damage to brake caliper pistons

- ◆ *The brake and the electromechanical parking brake must not be operated when the brake caliper has been detached.*



- Tie brake caliper to body with suitable wire.
- Remove brake pads.

#### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage when renewing brake pads.
- ◆ *Wear limit of brake discs ➤ page 6*



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- ◆ *Always renew brake pads on both sides of the axle.*
- ◆ *Install all parts supplied in the repair kit when fitting new brake pads.*
- ◆ *Renew bolts for brake caliper after removal.*



#### WARNING

##### Risk to health

- ◆ *Do not blow out the brake system with compressed air.*



#### Note

- ◆ *Use only methylated spirits to clean the brake caliper.*
- ◆ *Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit ➤ page 223.*

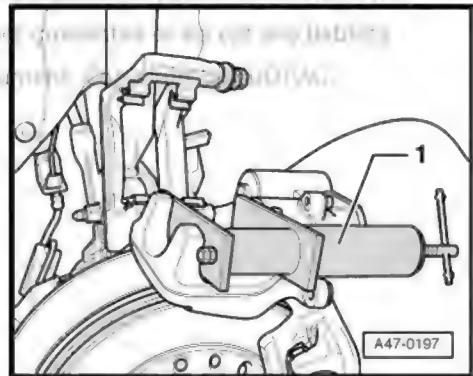


**Caution**

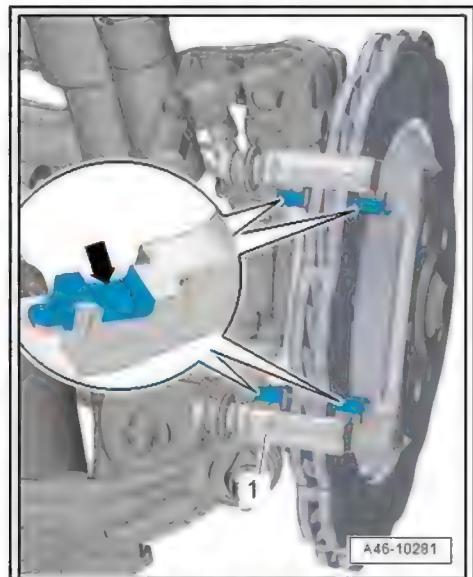
*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

- ◆ If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.
- ◆ Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.
- ◆ Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.

- Press back piston completely with piston resetting appliance - T10145-



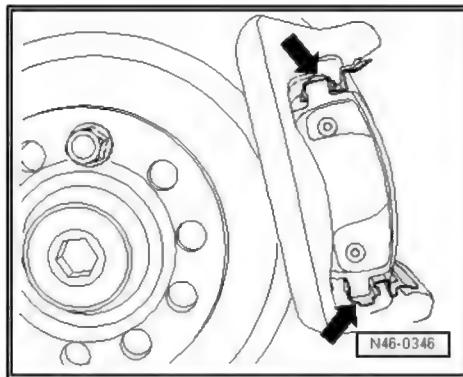
- Clean surfaces -arrow- on brake carrier that make contact with pad retaining springs.



- Fit pad retaining springs (note correct installation position).
- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Fit brake pads in brake carrier.

 Note

*Make sure the brake pads are positioned in the pad retaining springs -arrows-.*

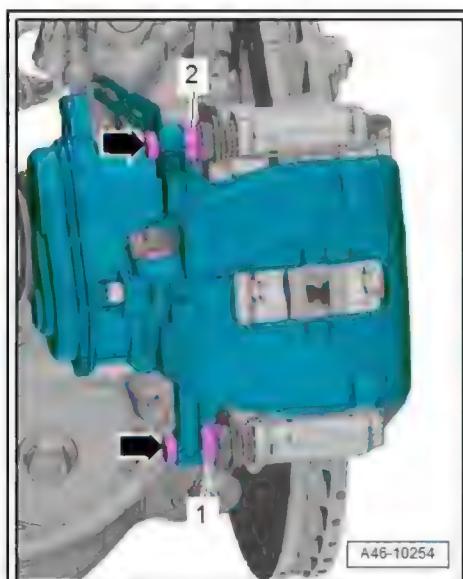


- Slide brake caliper over fitted brake pads.

 Note

*If the used brake pads are reinstalled, the pad wear indicator wire must be guided through the brake caliper.*

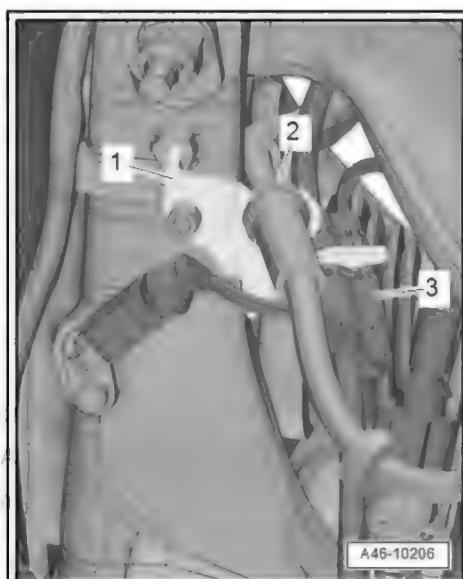
- Counterhold guide pins -1 and 2- and tighten new bolts -arrows- for brake caliper.



- Secure brake hose -2- and wiring harness -3- in bracket -1-.

 Note

- ◆ *Make sure the electrical wiring and brake hose are positioned correctly.*
- ◆ *The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.*



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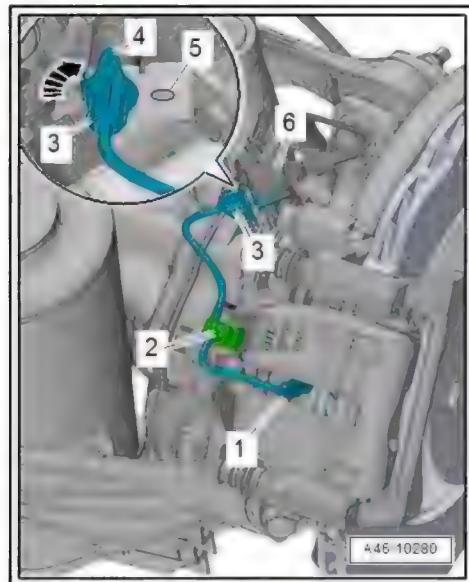
- If new brake pads are being fitted, insert contact -1- of pad wear sender into inner brake pad so that it engages.



**Note**

*Make sure the contact is properly seated in the brake pad.*

- Secure pad wear indicator wire with dust cap -2- as shown in illustration.
- Locate electrical connector -3- in installation position and turn in direction of -arrow- until tab -4- engages in hole -5- in bracket.
- Fit electrical connector -6-.
- Fit rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- Move parking brake motors forward using ⇒ Vehicle diagnostic tester; to do so follow the instructions on the screen.



**WARNING**

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

**Tightening torques**

- ◆ ⇒ “[2.1.1 Exploded view - rear brakes, steel version](#)”,  
[page 153](#)

## 2.2.2 Removing and installing brake pads - ceramic brakes

**Special tools and workshop equipment required**

- ◆ Vehicle diagnostic tester
- ◆ Torque wrench - V.A.G 1331-



**V.A.G 1331**

W00-111166

◆ Piston resetting appliance - T10145-



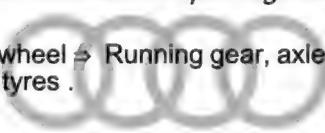
W00-11606

Removing

- Release parking brake.
- Switch off ignition.

Note

- ◆ *Mark brake pads when removing them if they are to be reinstalled. Reinstall in their original position to prevent uneven braking.*
- ◆ *Do not unplug electrical connectors of parking brake motors.*
- Remove relevant rear wheel ➤ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



Note

*The parking brake pistons must be moved back with the vehicle diagnostic tester if the brake pads are being renewed.*

- With ignition switched off, connect vehicle diagnostic tester to diagnostic connection in vehicle.
- Switch on ignition.
- After entering vehicle identification data, select Guided Functions mode.
- Move parking brake motors back:

Running gear/brake system

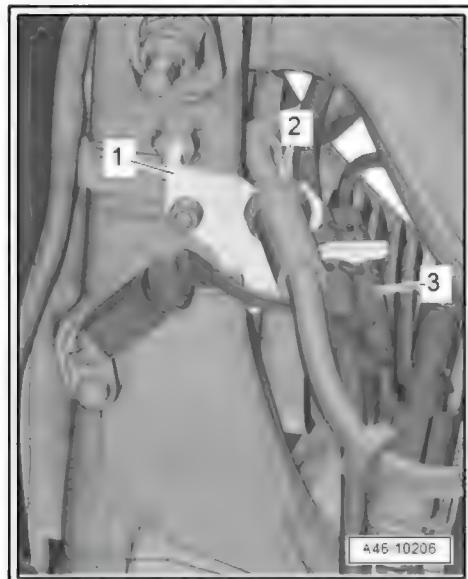
01 Self-diagnosis compatible systems
53 Control unit for electromechanical parking brake J540
53 Functions - electromechanical parking brake
53 46 Removing brake pads

- Continue to follow the instructions on the vehicle diagnostic tester display.

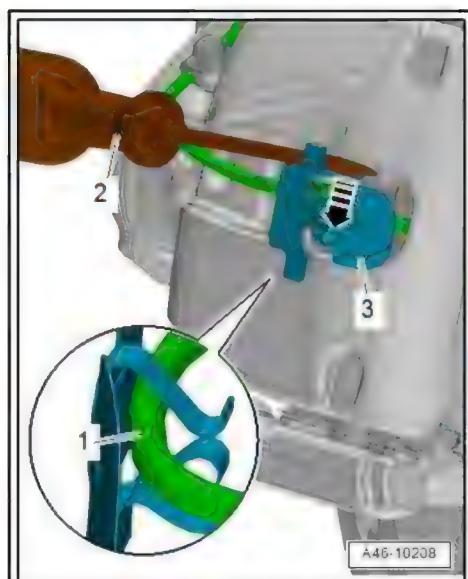


A00-10303

- Move clear brake hose -2- and wiring harness -3- at bracket -1-.



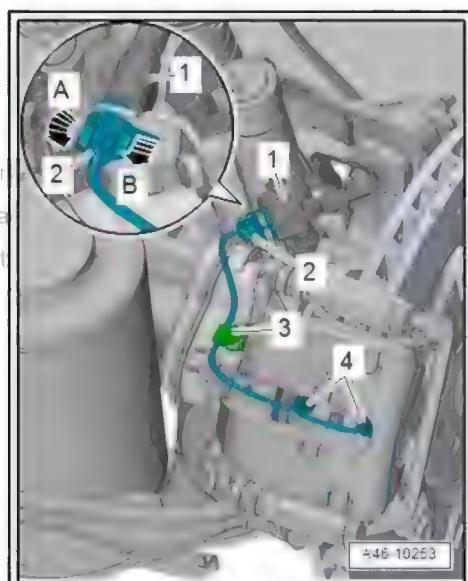
- Unclip bracket -3- using a screwdriver -2- -arrow-.
- Move clear electrical wire -1- for pad wear sender.



- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow B- and at the same time turn 90° -arrow A-.
- Detach dust cap -3- from bleeder screw and move electrical wiring clear right. Copying for private or commercial purposes, in part or in whole, is only permitted unless authorised by AUDI AG. AUDI AG does not guarantee or accept responsibility for any damage which may result from incorrect use of the information provided.

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*Disregard -item 4-*



- Counterhold guide pins -1 and 2- and remove bolts -arrows-.
- Detach brake caliper (guide out electrical wire for pad wear sender).



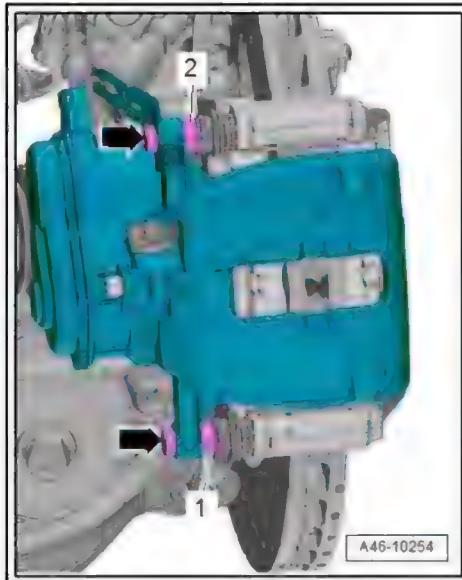
#### Caution

##### *Risk of damage to brake hose*

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*

##### *Risk of damage to brake caliper pistons*

- ◆ *The brake and the electromechanical parking brake must not be operated when the brake caliper has been detached.*



- Tie brake caliper to body with suitable wire.
- Detach brake pads and pad retaining springs.

#### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage when renewing brake pads.
- ◆ Cracks in the bolted joint area [⇒ page 12](#)
- ◆ Edge fractures [⇒ page 13](#)
- ◆ Chipping [⇒ page 13](#)
- ◆ Cracks extending into cooling channels [⇒ page 14](#)
- ◆ Assessing degree of wear [⇒ page 14](#)



#### Note

- ◆ *Always renew brake pads on both sides of the axle.*
- ◆ *Install all parts supplied in the repair kit when fitting new brake pads.*
- ◆ *Renew bolts for brake caliper after removal.*



#### WARNING

##### *Risk to health*

- ◆ *Do not blow out the brake system with compressed air.*



#### Note

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- ◆ *Use only methylated spirits to clean the brake caliper.*
- ◆ *Check protective caps on brake caliper pistons for damage; if necessary, install all parts supplied in repair kit [⇒ page 228](#).*



### Caution

*Escaping brake fluid can cause the vehicle to become dirty and may damage the paintwork.*

- ◆ If the brake pads are worn and brake fluid has been topped up unnecessarily, brake fluid can overflow when the piston(s) are pressed back into the brake cylinders.
- ◆ Before pressing the piston(s) back, check the brake fluid level. Brake fluid must be extracted if the fluid level is up to the "MAX" mark.
- ◆ Use brake filling and bleeding equipment - VAS 5234- to extract brake fluid from brake fluid reservoir.

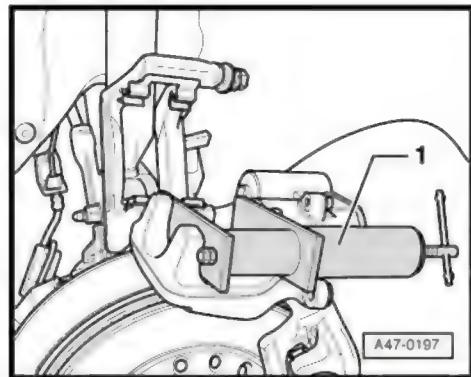
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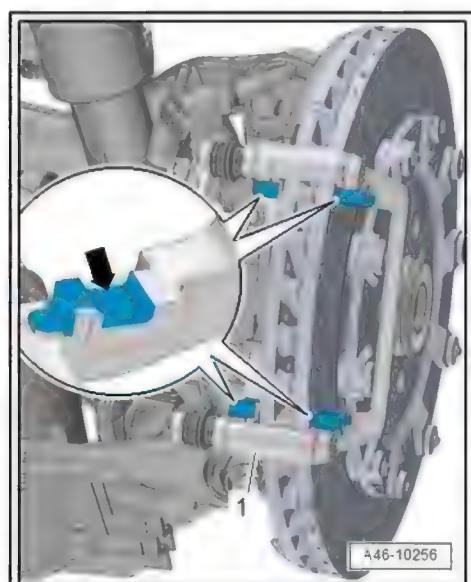
### Note

- ◆ The compressor nut is moved back on the spindle when the pistons are moved back using the vehicle diagnostic tester.
- ◆ The piston must then be pressed back fully with the piston resetting appliance - T10145-.

- Press back piston completely with piston resetting appliance - T10145- .



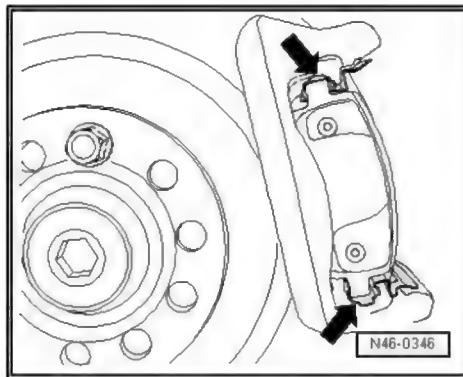
- Clean surfaces -arrow- on brake carrier that make contact with pad retaining springs.



- Fit pad retaining springs (note correct installation position).
- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Fit brake pads in brake carrier.

 Note

*Make sure the brake pads are positioned in the pad retaining springs -arrows-.*



- Slide brake caliper over fitted brake pads.

 Note

*If the used brake pads are reinstalled, the electrical wire for the pad wear sender must be guided through the brake caliper.*

- Counterhold guide pins -1 and 2- and tighten new bolts -arrows- for brake caliper.

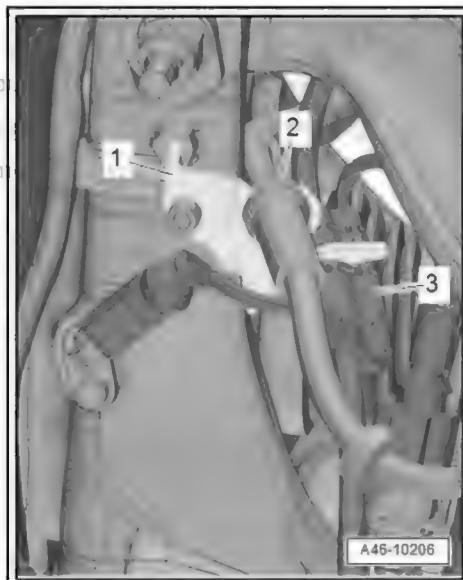
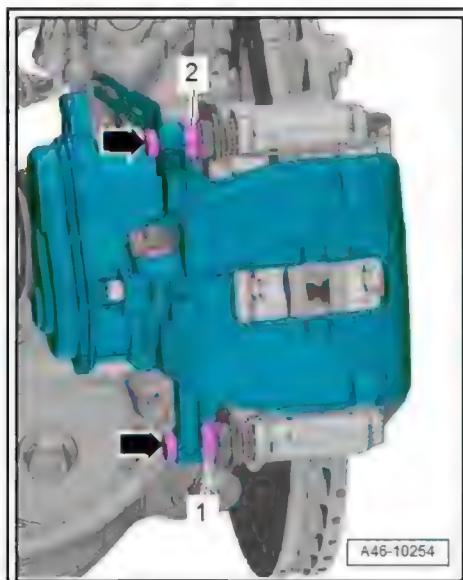


- Secure brake hose -2- and wiring harness -3- in bracket -1-.

 Note

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- ◆ *Make sure the electrical wiring and brake hose are positioned correctly.*
- ◆ *The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.*



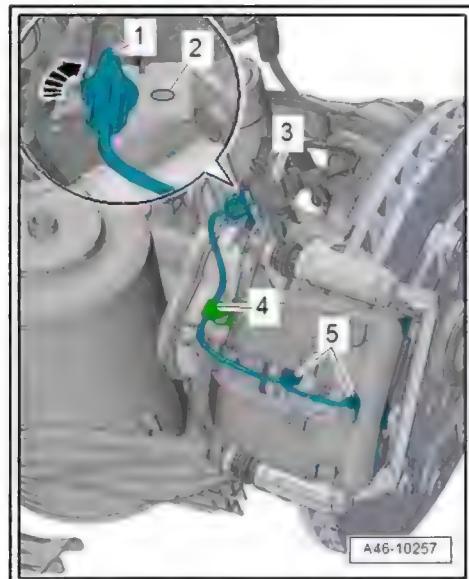
- If new brake pads are being fitted, insert contacts -5- of pad wear sender into brake pads so that they engage.



Note

*Make sure the contacts for the pad wear sender are properly seated in the brake pads.*

- Secure electrical wire for pad wear sender with dust cap -4- as shown in illustration.
- Locate electrical connector in installation position and turn in direction of -arrow- until tab -1- engages in hole -2- in bracket.
- Plug in electrical connector -3-.
- Fit rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- Move parking brake motors forward using ⇒ Vehicle diagnostic tester; to do so follow the instructions on the screen.



**WARNING**

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

Tightening torques

- ◆ ⇒ “[2.1.2 Exploded view - rear brakes, ceramic version](#)”,  
[page 157](#)

## 2.3 Removing and installing brake caliper

⇒ “[2.3.1 Removing and installing brake caliper - steel version brakes](#)”, [page 171](#)

⇒ “[2.3.2 Removing and installing brake caliper - ceramic brakes](#)”,  
[page 174](#)

### 2.3.1 Removing and installing brake caliper - steel version brakes



Note

*In the following procedure the brake caliper is removed together with the brake carrier and brake pads. The brake hose remains connected.*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-



#### Removing

- Release parking brake.
- Switch off ignition.

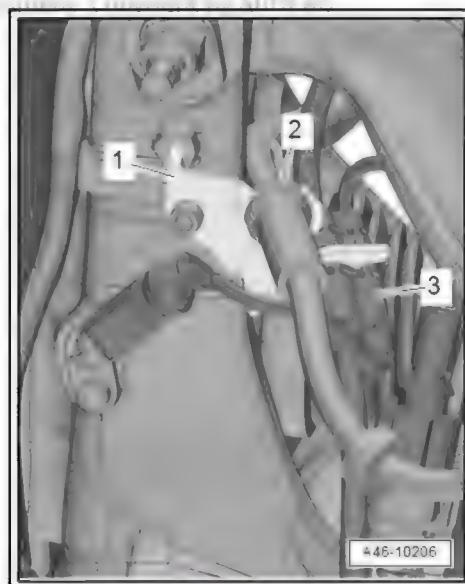


Note

*Do not unplug electrical connectors of parking brake motors.*

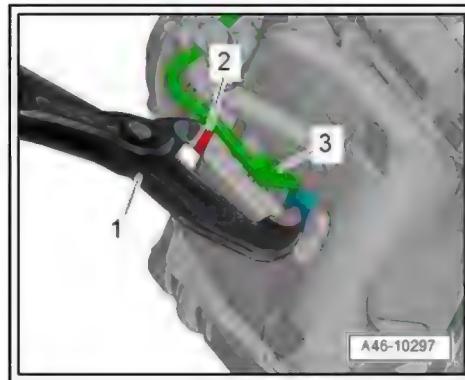
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- Remove relevant rear wheel ➤ **Running gear, axles, steering;**  
Rep. gr. 44 ; Wheels, tyres .
- Move clear brake hose -2- and wiring harness -3- at bracket -1-.



Note

- ◆ *To make it easier to detach the brake caliper from the brake disc, use suitable pliers -1- to press back the inner brake pad slightly into the brake caliper. To avoid damaging the paint on the caliper, insert a piece of rubber -2- between the caliper and the pliers.*
- ◆ *Take care not to damage contact -3- for pad wear sender.*



- Remove bolts -arrows- securing brake carrier.
- Pull brake caliper with brake carrier and brake pads fitted off brake disc.



Note

*If the brake disc is worn down to such an extent that the brake caliper cannot be pulled off, the parking brake must be retracted as required [⇒ page 159](#).*



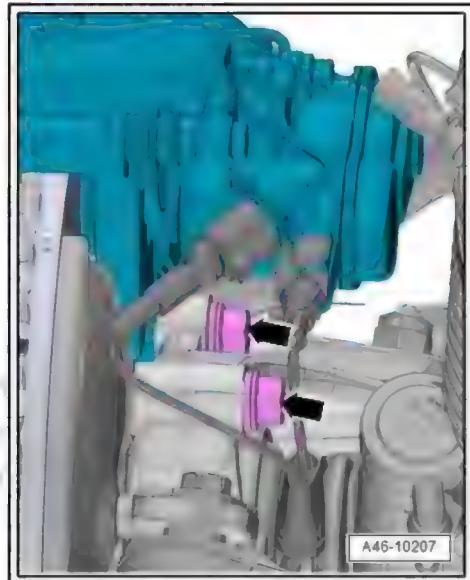
Caution

**Risk of damage to brake hose**

- ◆ *Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.*
- ◆ *The brake hose must be renewed if it is damaged.*

**Risk of damage to brake caliper pistons**

- ◆ *The brake and the electromechanical parking brake must not be operated when the brake caliper has been detached.*



- Use a suitable length of wire to tie up brake caliper with brake carrier on the body.

**Installing**

Installation is carried out in reverse order; note the following:



Note

*Renew bolts for brake carrier after removal.*



WARNING

**Risk to health**

- ◆ *Do not blow out the brake system with compressed air.*

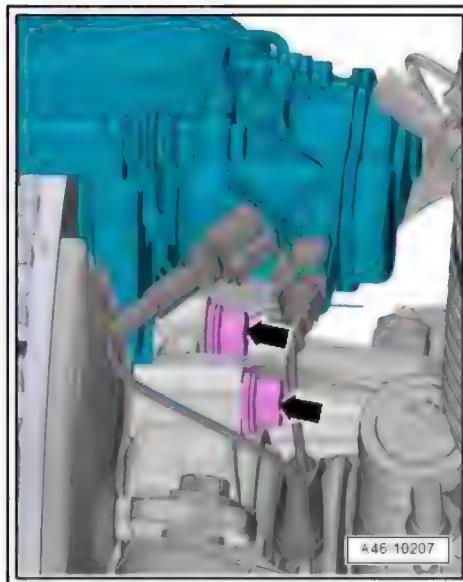


Note

*Use only methylated spirits to clean the brake caliper.*

- Slide brake caliper with brake carrier and brake pads fitted carefully over brake disc.

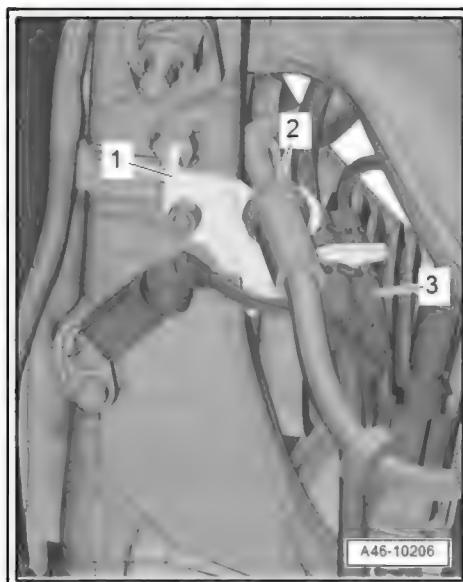
- Tighten new bolts -arrows- for brake carrier.



- Secure brake hose -2- and wiring harness -3- in bracket -1-.

 Note

- ◆ Make sure the electrical wiring and brake hose are positioned correctly.
- ◆ The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.
- Fit rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Move parking brake motors forward using ⇒ Vehicle diagnostic tester; to do so follow the instructions on the screen.



**WARNING**

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

**Tightening torques**

- ◆ ⇒ "2.1.1 Exploded view - rear brakes, steel version", page 153

### 2.3.2 Removing and installing brake caliper - ceramic brakes

 Note

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In the following procedure the brake caliper is removed together with the brake carrier and brake pads. The brake hose remains connected.  
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Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1332-

V.A.G 1332



W00-11165

Removing

Removing

- Release parking brake.
- Switch off ignition.

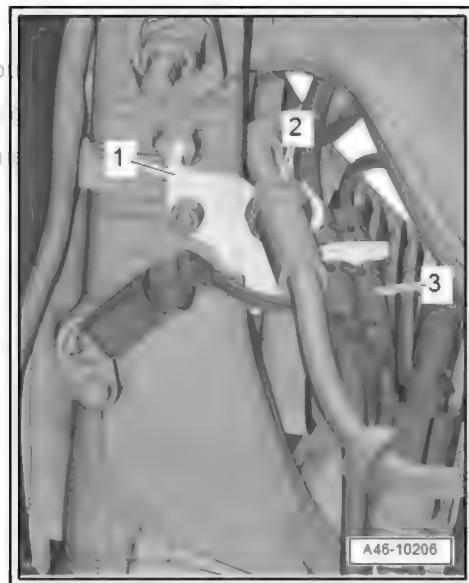


Note

*Do not unplug electrical connectors of parking brake motors.*

- Remove rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Move clear brake hose -2- and wiring harness -3- at bracket -1-.

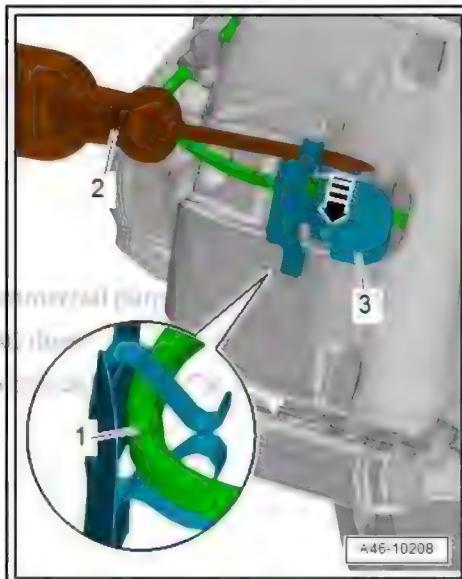
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- Unclip bracket -3- using a screwdriver -2- -arrow-.
- Move pad wear indicator wire -1- clear.

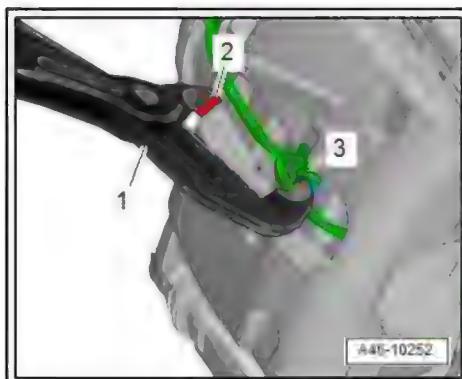


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Note

- ◆ To make it easier to detach the brake caliper from the brake disc, use suitable pliers -1- to press back the inner brake pad slightly into the brake caliper. To avoid damaging the paint on the caliper, insert a piece of rubber -2- between the caliper and the pliers.
- ◆ Take care not to damage contact -3- for pad wear sender.



- Remove bolts -arrows- securing brake carrier.
- Carefully pull brake caliper with brake carrier and brake pads fitted off brake disc.



Note

If the brake disc is worn down to such an extent that the brake caliper cannot be pulled off, the parking brake must be retracted as required [⇒ page 165](#).



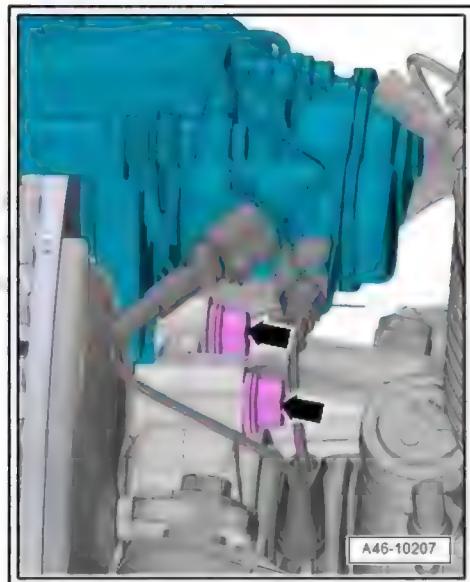
Caution

*Risk of damage to brake hose*

- ◆ Do not leave the brake caliper hanging from the brake hose. Take care that brake hose is not damaged by weight of brake components.
- ◆ The brake hose must be renewed if it is damaged.

*Risk of damage to brake caliper pistons*

- ◆ The brake and the electromechanical parking brake must not be operated when the brake caliper has been detached.



- Use a suitable length of wire to tie up brake caliper with brake carrier on the body.

**Installing**

Installation is carried out in reverse order; note the following:



Note

*Renew bolts for brake carrier after removal.*



WARNING

*Risk to health*

- ◆ Do not blow out the brake system with compressed air.

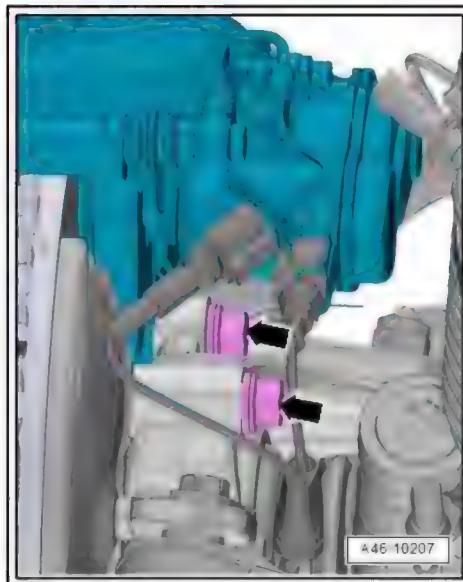


Note

*Use only methylated spirits to clean the brake caliper.*

- Slide brake caliper with brake carrier and brake pads fitted carefully over brake disc.

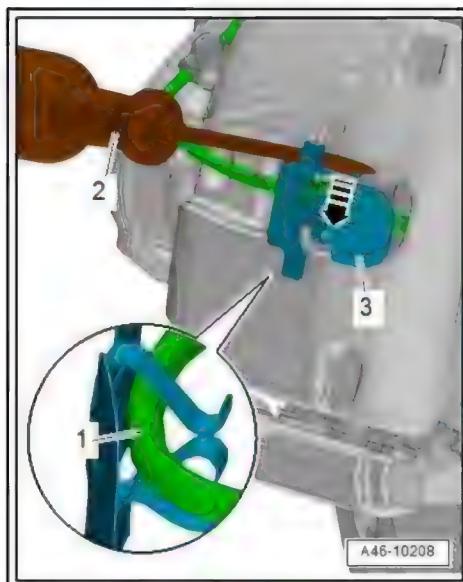
- Tighten new bolts -arrows- for brake carrier.



- Guide electrical wire -1- for pad wear indicator into bracket -3- as shown in illustration.
- Clip bracket into brake caliper.

 Note

*Disregard items marked -2- and -arrow-.*



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- Press brake hose -2- and wiring harness -3- into bracket -1-.



Note

- ◆ Make sure that all electrical wiring is properly clipped into the brackets on the hub carrier and secured so that it cannot come loose.
- ◆ Make sure the brake hose is routed correctly.
- ◆ The brake hose must not be kinked or crushed or chafe against the body at any point.

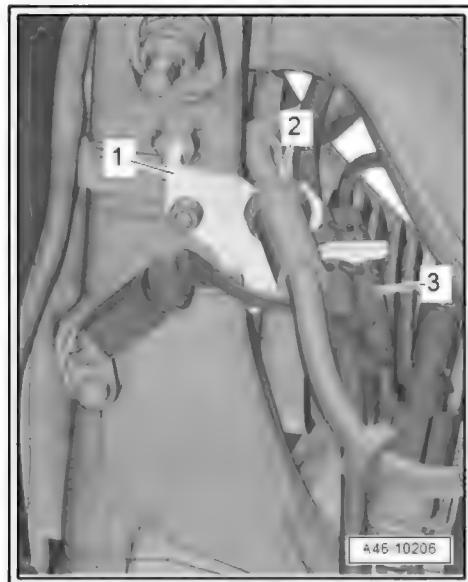
- Fit rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Move parking brake motors forward using ⇒ Vehicle diagnostic tester; to do so follow the instructions on the screen.



**WARNING**

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



Tightening torques

- ◆ ⇒ “2.1.2 Exploded view - rear brakes, ceramic version”, page 157

## 2.4 Renewing brake caliper

⇒ “2.4.1 Renewing brake caliper - steel version brakes”, page 179

⇒ “2.4.2 Renewing brake caliper - ceramic brakes”, page 184

### 2.4.1 Renewing brake caliper - steel version brakes

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Note

*In the following procedure the brake caliper is removed and renewed without the brake carrier and brake pads. The brake hose is disconnected.*

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Brake pedal actuator - V.A.G 1869/2-



### Removing

- Release parking brake.
- Switch off ignition.
- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal at least 60 mm.

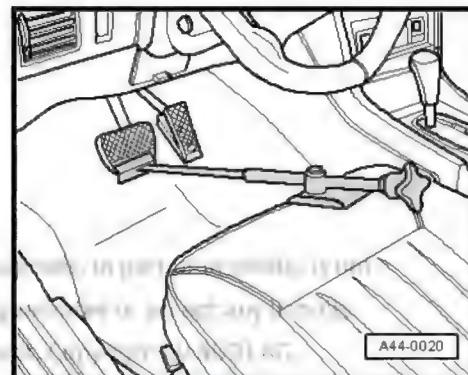


Note



*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*

- Remove relevant rear wheel ➡ Running gear, axles, steering; Rep. gr. 44 (Wheels, tyres)

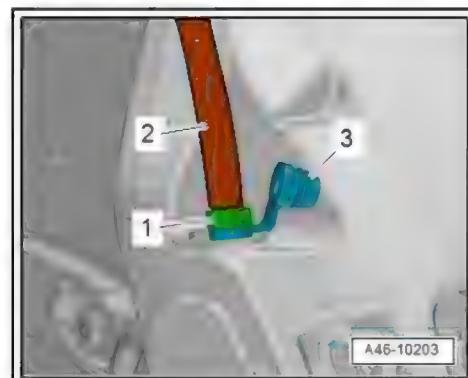


- Detach protective cap -3- from bleeder screw -1-.
- Connect hose -2- from bleeder bottle as shown in illustration.
- Open bleeder screw to relieve pressure in brake system.
- Close bleeder screw and remove bleeder bottle.

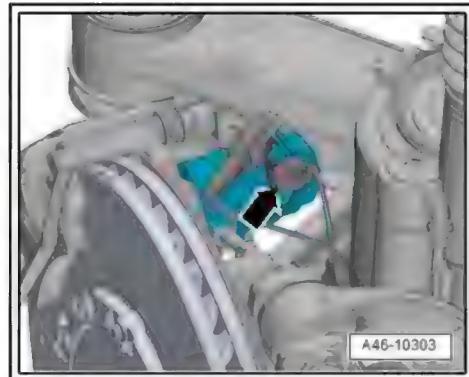


Note

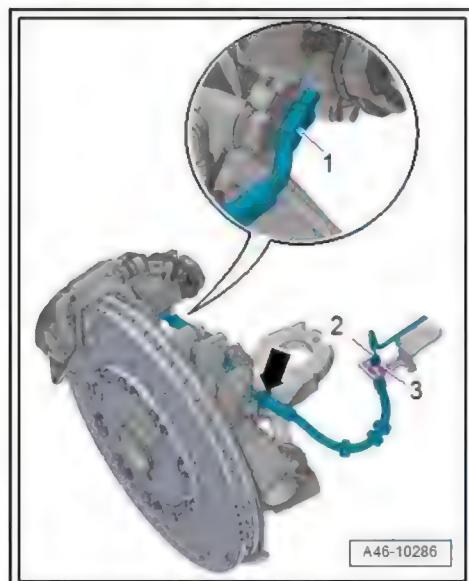
*The brake pedal actuator - V.A.G 1869/2- must not be removed.*



- Unplug electrical connector -arrow- at electromechanical parking brake motor.



- Unscrew union screw -2-.
- Move brake hose clear from bracket -arrow-.
- Disconnect brake hose -1- from brake caliper.

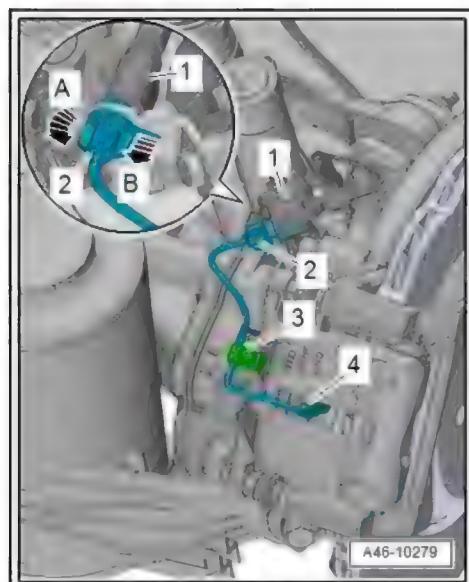


- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow B- and at the same time turn 90° -arrow A-.
- Detach dust cap -3- from bleeder screw and move electrical wiring clear.



Note

*Disregard -item 4-*



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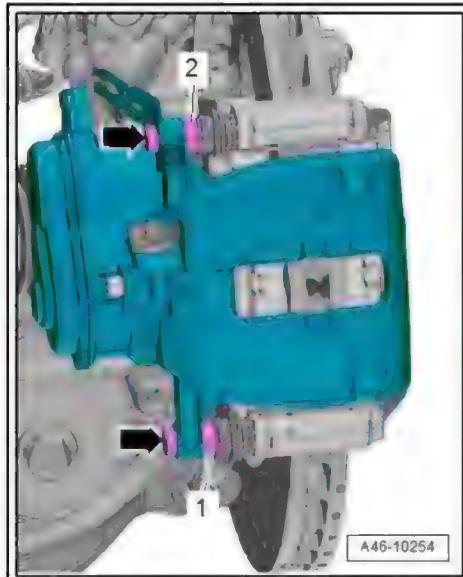
- Counterhold guide pins -1 and 2- and remove bolts -arrows-.
- Detach brake caliper (guide out pad wear indicator wire).
- Remove electromechanical parking brake motor  
[⇒ page 200](#) .



Note

*Mark brake pads when removing them if they are to be reinstalled.  
Reinstall in their original position to prevent uneven braking.*

- Detach brake pads and pad retaining springs.



A46-10254

### Installing

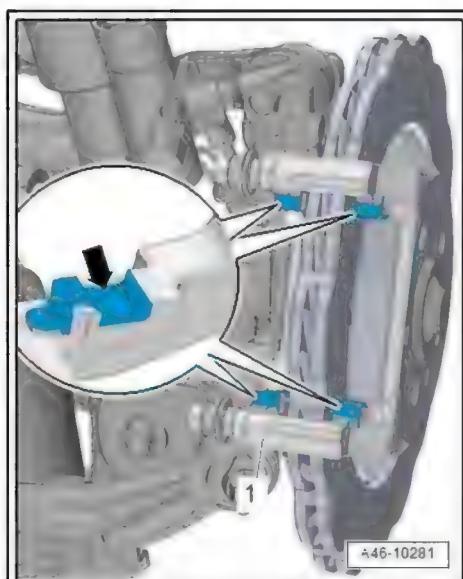
Installation is carried out in reverse order; note the following:



Note

*Renew bolts for brake caliper.*

- Clean surfaces -arrow- on brake carrier that make contact with pad retaining springs.



A46-10281

- Fit pad retaining springs (note correct installation position).
- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Fit brake pads in brake carrier.

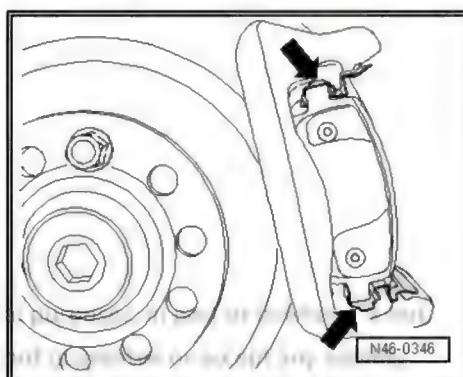


Note

*Make sure the brake pads are positioned in the pad retaining springs -arrows-*

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- Install electromechanical parking brake motor [⇒ page 200](#) .
- Slide brake caliper over fitted brake pads.



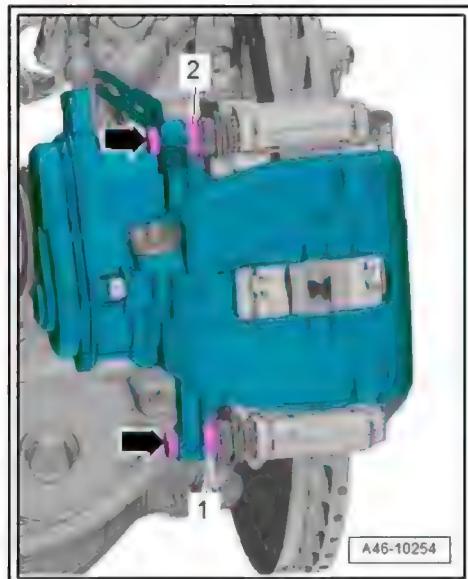
N46-0346



Note

*If the used brake pads are reinstalled, the electrical wire for the pad wear sender must be guided through the brake caliper.*

- Counterhold guide pins -1 and 2- and tighten new bolts -arrows- for brake caliper.



A46-10254

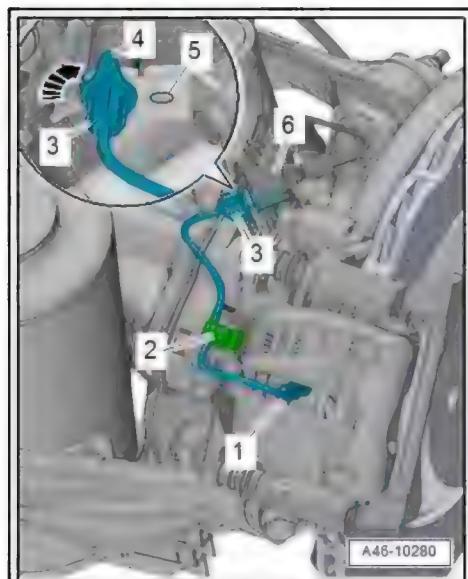
Note

*Make sure the pad wear sender is properly seated in the brake pad.*

- Secure electrical wire for pad wear sender with dust cap -2- as shown in illustration.
- Locate electrical connector -3- in installation position and turn in direction of -arrow- until tab -4- engages in hole -5- in bracket.
- Plug in electrical connector -6-.

Note

*Disregard -item 1-.*



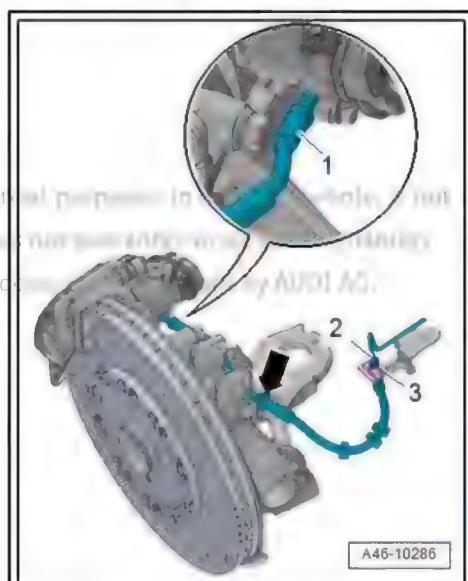
A46-10280

- Attach brake hose -1- to caliper and tighten connection.
- Check retaining spring -3- for damage and renew if necessary.
- Insert brake hose into bracket -arrow- and connect to brake line: tighten union screw -2-.

Note

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- ◆ *Make sure the brake hose is routed correctly.*
- ◆ *The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.*

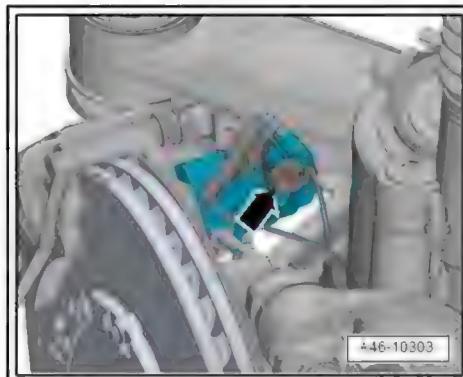


A46-10286

- Plug in electrical connector -arrow- at electromechanical parking brake motor.
- Remove brake pedal actuator - V.A.G 1869/2- .
- Move parking brake motors forward using ⇒ Vehicle diagnostic tester; to do so follow the instructions on the screen.
- Bleed brake system (only at wheel where caliper was detached and brake hose disconnected) [⇒ page 273](#) .

 Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*



 Note

*If the brake pedal still feels "soft", bleed the complete brake system.*

 Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*

- Fit rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ;  
Wheels, tyres .



**WARNING**

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

Tightening torques

- ◆ [⇒ "2.1.1 Exploded view - rear brakes, steel version",  
page 153](#)

## 2.4.2 Renewing brake caliper - ceramic brakes

 Note

*In the following procedure the brake caliper is removed and renewed without the brake carrier and brake pads. The brake hose is disconnected.*

Special tools and workshop equipment required

◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166

◆ Brake pedal actuator - V.A.G 1869/2-

VAG 1869/2



W00-11589

**Removing**

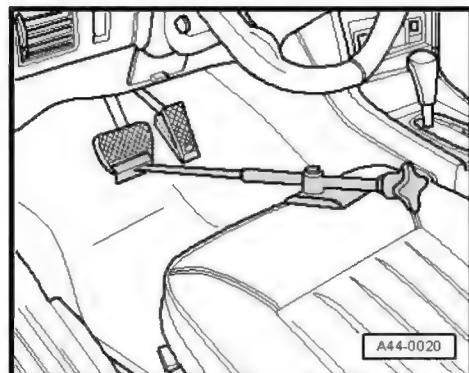
- Release parking brake.
- Switch off ignition.
- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Depress brake pedal at least 60 mm.



**Note**

*This closes the valves in the brake master cylinder and stops the brake fluid reservoir from running empty.*

- Remove rear wheel: observe precautions for vehicles with ceramic brakes ➔ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Detach protective cap -3- from bleeder screw -1-.
- Connect hose -2- from bleeder bottle as shown in illustration.
- Open bleeder screw to relieve pressure in brake system.
- Close bleeder screw and remove bleeder bottle.

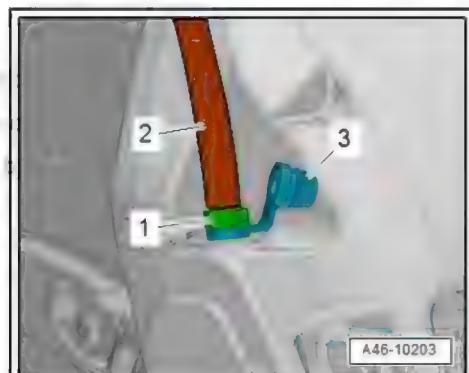


A44-0020



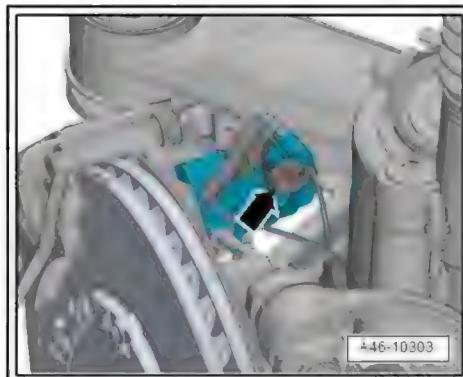
**Note**

*The brake pedal actuator - V.A.G 1869/2- must not be removed.*



A46-10203

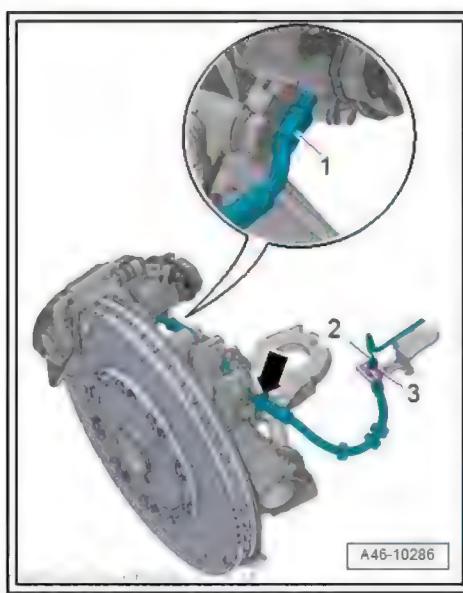
- Unplug electrical connector -arrow- at electromechanical parking brake motor.



- Unscrew union screw -2-.
- Move brake hose clear from bracket -arrow-.
- Disconnect brake hose -1- from brake caliper.



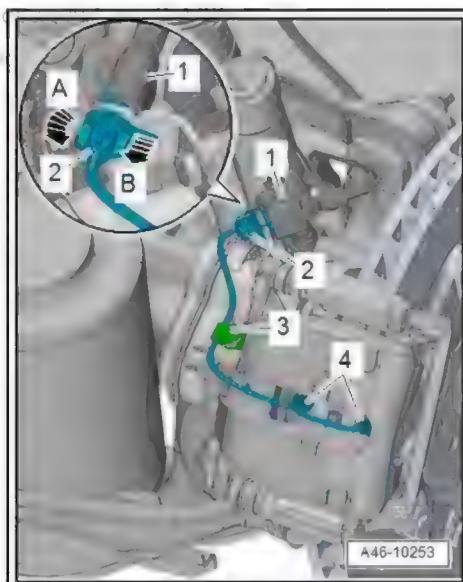
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- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow B- and at the same time turn 90° -arrow A-.
- Detach dust cap -3- from bleeder screw and move electrical wiring clear.



*Disregard -item 4-.*



- Counterhold guide pins -1 and 2- and remove bolts -arrows-.
- Detach brake caliper (guide out pad wear indicator wire).
- Remove actuator motor for electromechanical parking brake  
[⇒ page 200](#).



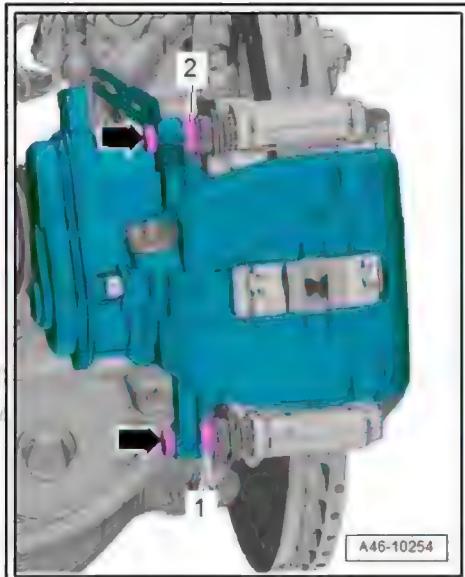
Note

*Mark brake pads when removing them if they are to be reinstalled.  
 Reinstall in their original position to prevent uneven braking.*

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- Detach brake pads and pad retaining springs.

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### Installing

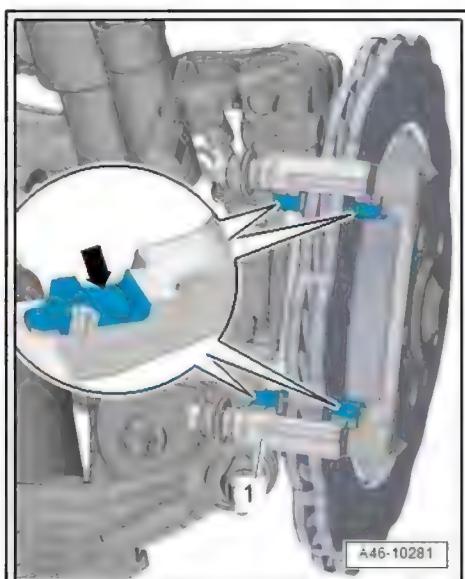
Installation is carried out in reverse order; note the following:



Note

*Renew bolts for brake caliper.*

- Clean surfaces -arrow- on brake carrier that make contact with pad retaining springs.



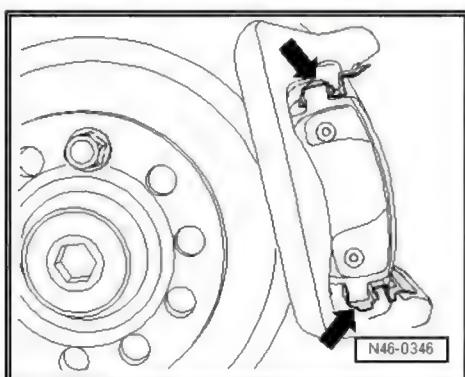
- Fit pad retaining springs (note correct installation position).
- If used pads are being re-fitted, take care to install the marked pads in their original positions.
- Fit brake pads in brake carrier.



Note

*Make sure the brake pads are positioned in the pad retaining springs -arrows-.*

- Install electromechanical parking brake motor [⇒ page 200](#).
- Slide brake caliper over fitted brake pads.



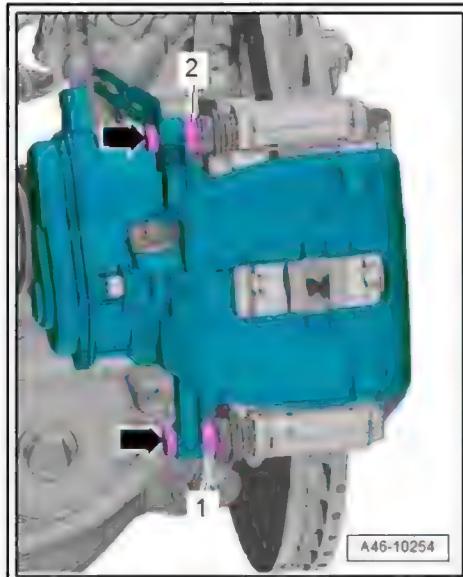
Note

*If the used brake pads are reinstalled, the electrical wire for the pad wear sender must be guided through the brake caliper.*

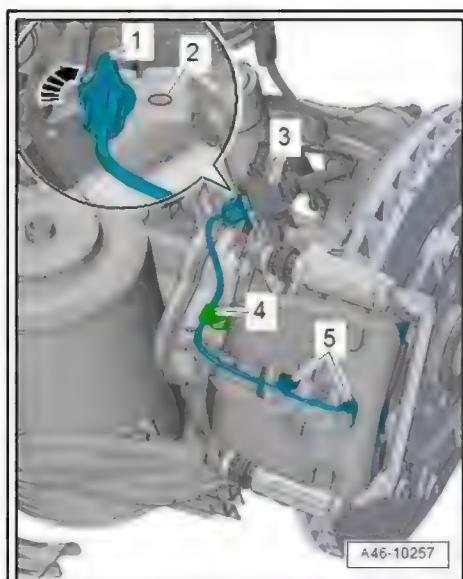
- Counterhold guide pins -1 and 2- and tighten new bolts  
-arrows- for brake caliper.



*Make sure the pad wear sender is properly seated in the brake pad.*



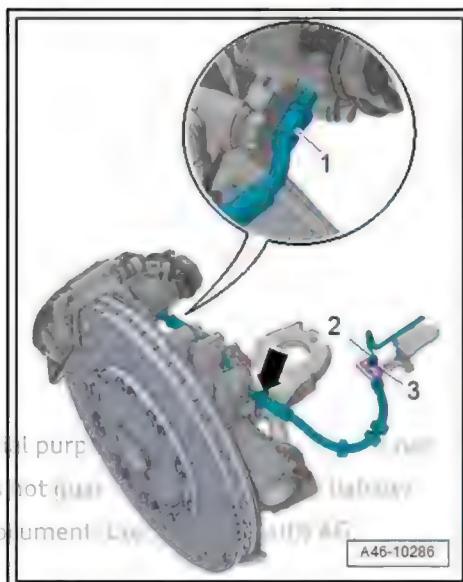
- Secure pad wear indicator wire with dust cap -4- as shown in illustration.
- Locate electrical connector in installation position and turn in direction of -arrow- until tab -1- engages in hole -2- in bracket.
- Plug in electrical connector -3-.



- Attach brake hose -1- to caliper and tighten connection.
- Check retaining spring -3- for damage and renew if necessary.
- Insert brake hose into bracket -arrow- and connect to brake line: tighten union screw -2-.



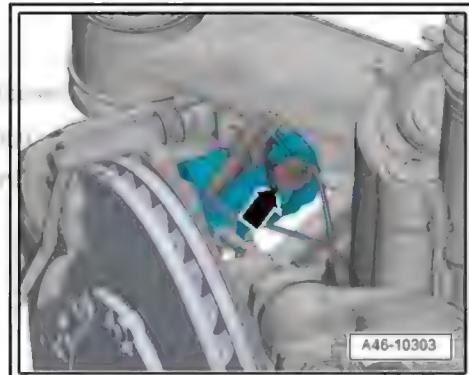
- ◆ *Make sure the brake hose is routed correctly.*
- ◆ *The brake hose must not be kinked, crushed or twisted or chafe against parts of the vehicle at any point.*



- Plug in electrical connector -arrow- at electromechanical parking brake motor.
- Remove brake pedal actuator ⇒ V.A.G 1869/2
- Move parking brake motors forward using → Vehicle diagnostic tester; to do so follow the instructions on the screen.
- Bleed brake system (only at wheel where caliper was detached and brake hose disconnected) ⇒ [page 273](#).

 Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*



 Note

*If the brake pedal still feels "soft", bleed the complete brake system.*

 Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*
- Fit rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



**WARNING**

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

Tightening torques

- ◆ ⇒ ["2.1.2 Exploded view - rear brakes, ceramic version"](#),  
[page 157](#)

## 2.5 Removing and installing brake disc

⇒ ["2.5.1 Removing and installing brake disc - steel version brakes"](#), [page 189](#)

⇒ ["2.5.2 Removing and installing brake disc - ceramic brakes"](#),  
[page 191](#)

### 2.5.1 Removing and installing brake disc - steel version brakes

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-

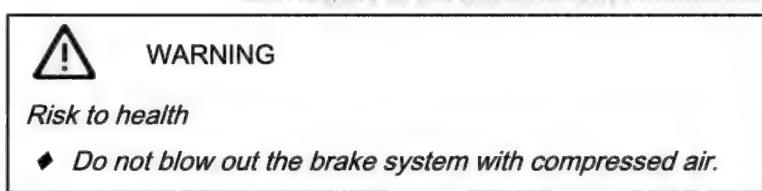
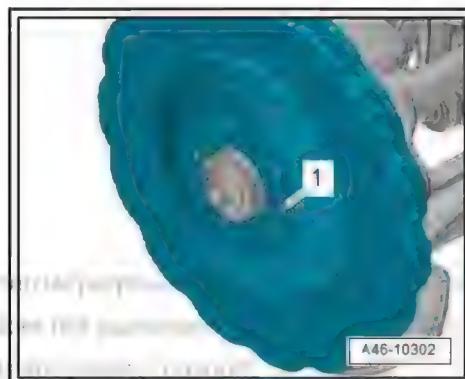
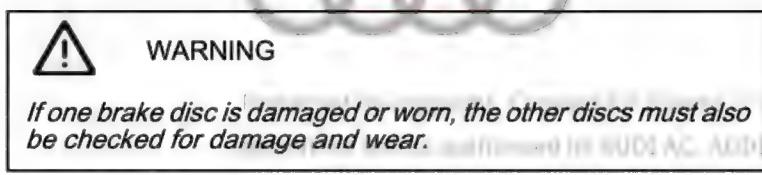


#### Removing

- If the used brake disc is to be reinstalled with the used brake pads, remove the brake caliper [⇒ page 171](#).
- If the brake pads and brake disc are being renewed, remove the brake pads [⇒ page 159](#).
- Loosen bolt -1- and take off brake disc.

#### Installing

- Check brake discs for wear and damage before reinstalling:
- ◆ Wear limit of brake discs [⇒ page 6](#)



Use only methylated spirits to clean the brake caliper.

- Clean contact surface of brake disc and wheel hub thoroughly and remove corrosion.
- Fit brake disc onto wheel hub.



Take care to keep the brake disc straight when fitting it on the wheel hub.

- Tighten bolt -1-.
- Install brake caliper [⇒ page 171](#) or brake pads [⇒ page 159](#) .



#### WARNING

*Risk of accident!*

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*



A46-10302

#### Tightening torques

- ◆ [⇒ "2.1.1 Exploded view - rear brakes, steel version", page 153](#)

### 2.5.2 Removing and installing brake disc - ceramic brakes

#### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



W00-11166

#### Removing

- If the used brake disc is to be reinstalled with the used brake pads, remove the brake caliper [⇒ page 174](#) .
- If the brake pads and brake disc are being renewed, remove the brake pads [⇒ page 165](#) .



#### Caution

*Risk of irreparable damage to ceramic brake disc*

- ◆ *Take care not to drop brake disc.*
- ◆ *Do not use a hammer to remove brake disc from wheel hub.*
- ◆ *Do not attempt to release brake disc from hub with any kind of lever.*

- Remove bolt -1- and take off brake disc by hand; do not use tools.

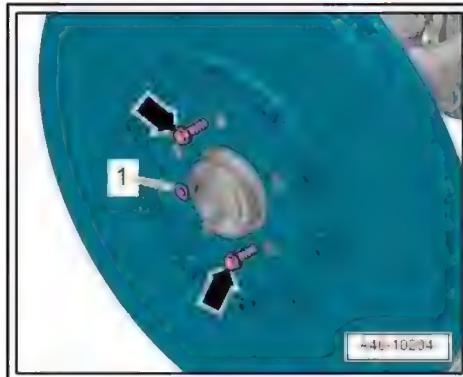
If the brake disc is difficult to remove, proceed as follows:

- Screw two M8 bolts -arrows- into threaded holes in brake disc until they make contact.
- Continue to screw in bolts alternately,  $\frac{1}{2}$  a turn at a time, so that brake disc comes off wheel hub.

#### Installing

Installation is carried out in reverse order; note the following:

- Check brake discs for wear and damage before reinstalling:
  - ◆ Cracks in the bolted joint area [⇒ page 12](#)
  - ◆ Edge fractures [⇒ page 13](#)
  - ◆ Chipping [⇒ page 13](#)
  - ◆ Cracks extending into cooling channels [⇒ page 14](#)
  - ◆ Assessing degree of wear [⇒ page 14](#)



#### WARNING

*If one brake disc is damaged or worn, the other discs must also be checked for damage and wear.*

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#### Note

*When fitting the brake discs, note the direction of rotation (marked with an arrow) and install accordingly on the left or right side of the vehicle.*



#### WARNING

*Risk to health*

- ◆ *Do not blow out the brake system with compressed air.*



#### Note

*Use only methylated spirits to clean the brake caliper.*

- Thoroughly clean contact surface of brake disc and wheel hub.

- Tighten bolt -1-.



Note

*Disregard -arrows-*

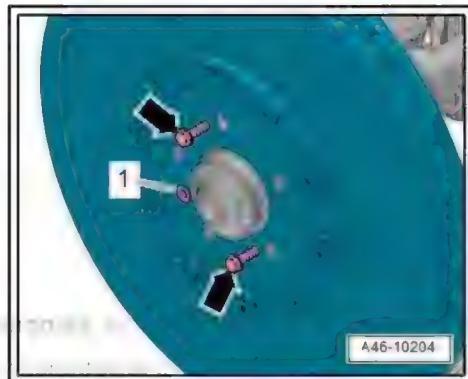
- Install brake caliper [⇒ page 174](#) or brake pads [⇒ page 165](#).



#### WARNING

##### Risk of accident!

- ◆ *Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.*
- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*



#### Tightening torques

- ◆ [⇒ "2.1.2 Exploded view - rear brakes, ceramic version", page 157](#)

## 2.6 Removing and installing splash plate

### Removing

- Remove rear brake disc [⇒ page 189](#).

### Vehicles with front-wheel drive:

- Remove wheel bearing unit ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Removing and installing wheel bearing unit .

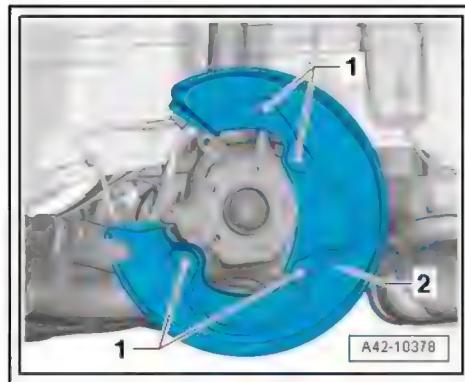
All vehicles (continued):

- Unscrew bolts -1- securing splash plate.
- Detach splash plate -2-.



Note

*Illustration shows installation position on a vehicle with four-wheel drive as an example.*



Installing

- Fit splash plate.
- Screw in and tighten bolts securing splash plate.

Vehicles with front-wheel drive:

- Install wheel bearing unit ⇒ Running gear, axles, steering; Rep. gr. 42 ; Wheel bearing, trailing arm; Removing and installing wheel bearing unit .

All vehicles (continued):

- Install rear brake disc [⇒ page 189](#) .



#### WARNING

*Risk of accident!*

- ◆ Depress brake pedal firmly several times with vehicle stationary so that brake pads are properly seated in normal operating position.
- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



## 2.7 Removing and installing pad wear indicator wire

[⇒ “2.7.1 Removing and installing pad wear indicator wire - steel version brakes”, page 194](#)

[⇒ “2.7.2 Removing and installing pad wear indicator wire - ceramic brakes”, page 195](#)

### 2.7.1 Removing and installing pad wear indicator wire - steel version brakes



Note

*The contacts for the brake pad wear sender cannot be removed without damage.*

Removing

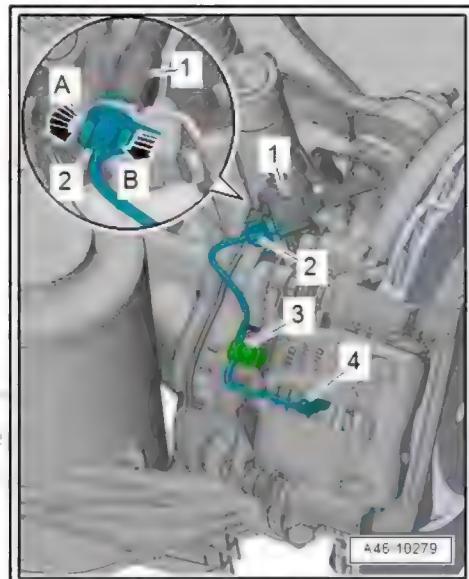
- Remove relevant rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow B- and at the same time turn 90° -arrow A-.
- Detach dust cap -3- from bleeder screw and move electrical wiring clear.
- Detach contact -4- for pad wear sender using pliers.



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#### Installing

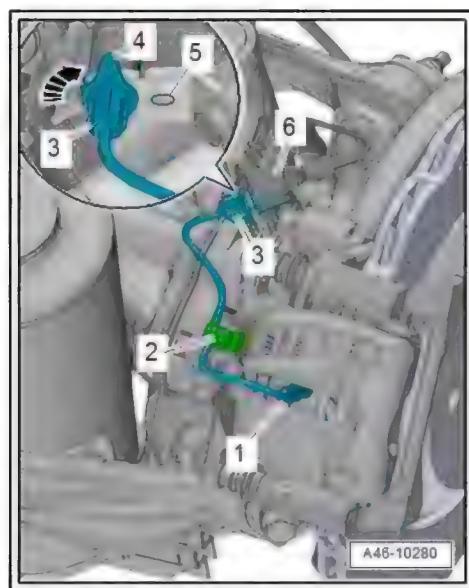
- Insert new contact -1- for pad wear sender into inner brake pad so that it engages.



#### Note

*Make sure the contact for the pad wear sender is properly seated in the brake pad.*

- Secure electrical wire for pad wear sender with dust cap -2- as shown in illustration.
- Locate electrical connector -3- in installation position and turn in direction of -arrow- until tab -4- engages in hole -5- in bracket.
- Fit electrical connector -6-.
- Fit rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



## 2.7.2 Removing and installing pad wear indicator wire - ceramic brakes



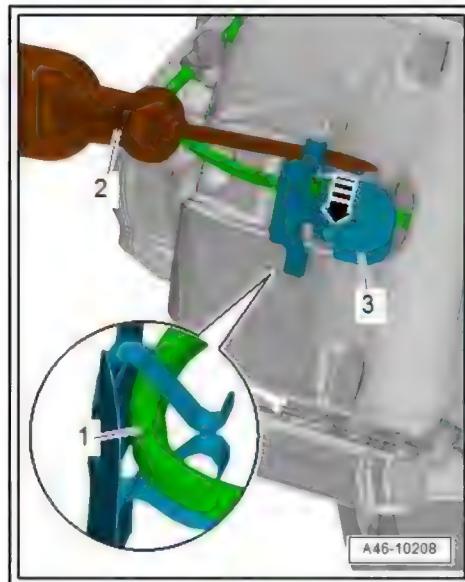
#### Note

*The contacts for the brake pad wear sender cannot be removed without damage.*

#### Removing

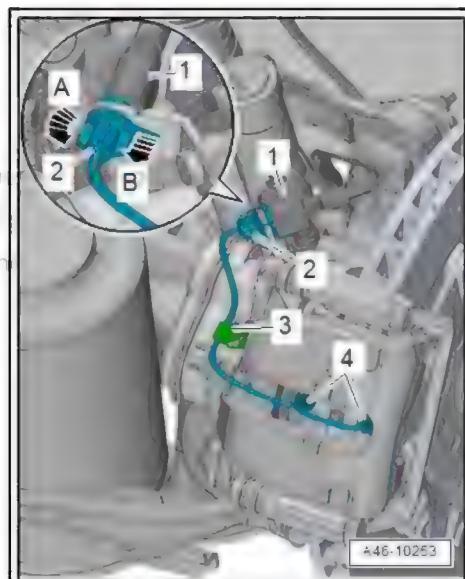
- Remove rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .

- Unclip bracket -3- using a screwdriver -2- -arrow-.
- Move pad wear indicator wire -1- clear.



- Unplug electrical connector -1- for pad wear sender.
- Release electrical connector -2- for pad wear sender from bracket -arrow B- and at the same time turn 90° -arrow A-.
- Detach dust cap -3- from bleeder screw and move electrical wiring clear.
- Detach contacts -4- for pad wear sender using pliers.

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### Installing

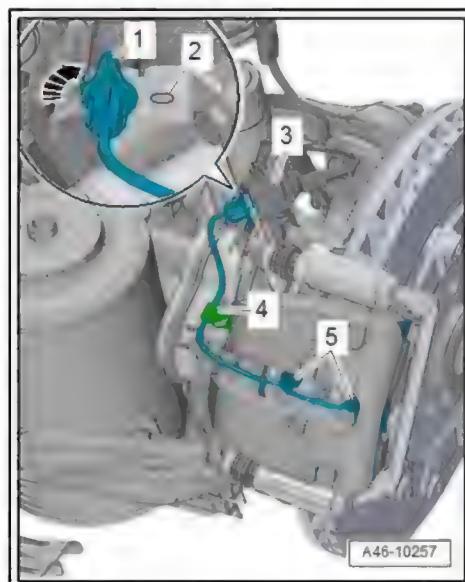
- Insert contacts -5- of pad wear senders into brake pads so that they engage.



#### Note

*Make sure the contacts for the pad wear sender are properly seated in the brake pads.*

- Secure electrical wire for pad wear sender with dust cap -4- as shown in illustration.
- Locate electrical connector in installation position and turn in direction of -arrow- until tab -1- engages in hole -2- in bracket.
- Plug in electrical connector -3-.



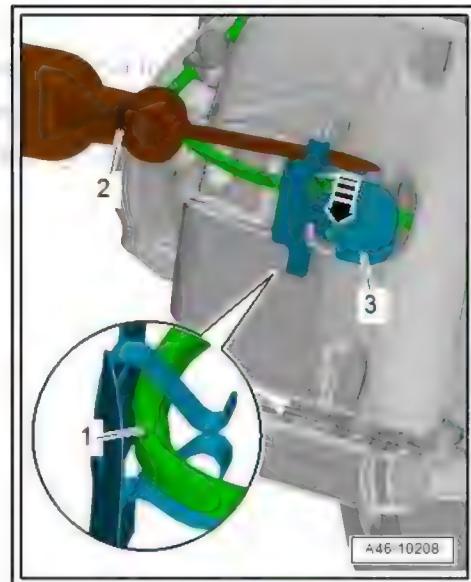
- Guide electrical wire -1- for pad wear sender into bracket -3- as shown in illustration.
- Clip bracket into brake caliper.



with respect to the correctness of information in this document.

**Note**  
*Disregard items marked -2- and -arrow-.*

- Fit rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



### 3 Parking brake

- ⇒ “3.1 Overview of fitting locations - parking brake”, page 198
- ⇒ “3.2 Removing and installing control unit for electromechanical parking brake J540”, page 199
- ⇒ “3.3 Removing and installing parking brake motor V282 / V283”, page 200

#### 3.1 Overview of fitting locations - parking brake

1 - Electromechanical parking brake button - E538-

- Removing and installing  
⇒ Electrical system;  
Rep. gr. 96 ; Controls;  
Removing and installing  
electromechanical park-  
ing brake button -  
E538- / auto-hold button  
- E540-

2 - LED – indicates parking  
brake applied

3 - Indicator lamp for electro-  
mechanical parking brake sys-  
tem (yellow)

4 - Indicator lamp for electro-  
mechanical parking brake sys-  
tem

5 - Right parking brake motor -  
V283- for electromechanical  
parking brake

- Removing and installing  
⇒ page 200

- Tighten bolts to 12 Nm

6 - Control unit for electro-  
mechanical parking brake - J540-

- Fitting location  
⇒ page 199
- Removing and installing  
⇒ page 199

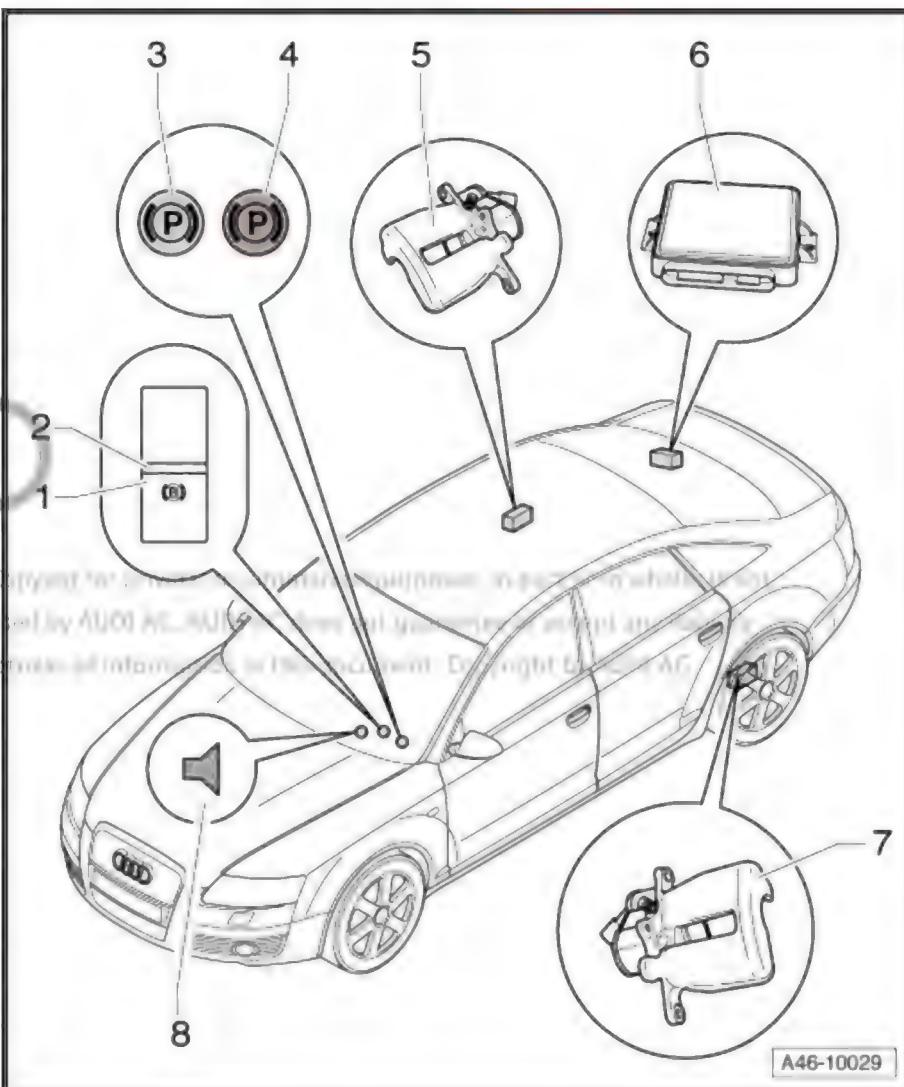
7 - Left parking brake motor -  
V282- for electromechanical  
parking brake

- Removing and installing  
⇒ page 200

- Tighten bolts to 12 Nm

8 - Acoustic signal

- Warning signal if parking brake is operated while vehicle is in motion
- Warning signal if a fault is detected in the system

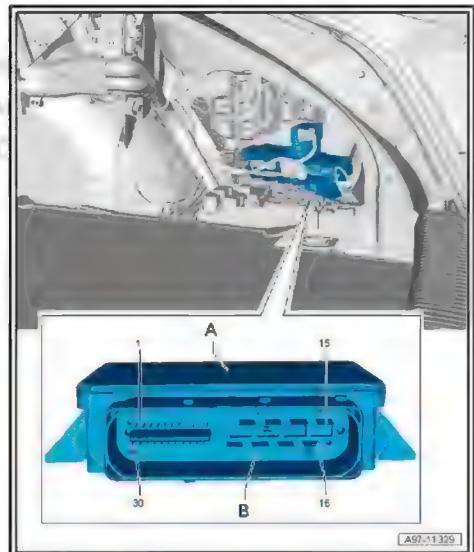


A46-10029



Fitting location and tightening torque for control unit for electro-mechanical parking brake - J540-

- ◆ Fitting location: behind luggage compartment side trim (right-side)
- Bolted version: Tighten nuts to 3 Nm.



### 3.2 Removing and installing control unit for electromechanical parking brake - J540-



#### Note

*When renewing control unit for electromechanical parking brake - J540-, select "Replace" function for control unit for electromechanical parking brake - J540- using ➤ Vehicle diagnostic tester, Guided Functions.*

Fitting location ➤ [page 199](#)

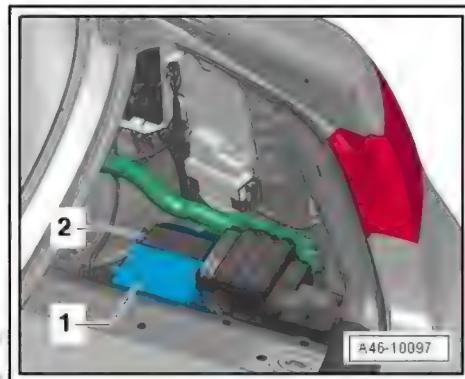
Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-



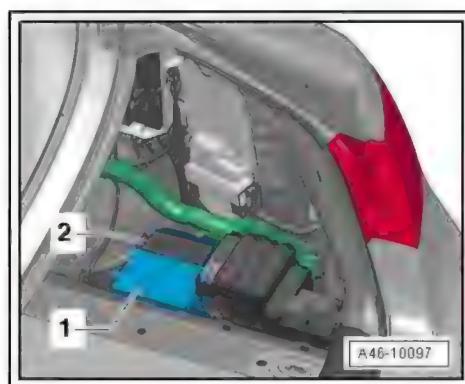
### Removing

- Open side cap in luggage compartment (rear right) and place it to one side.
- If fitted, remove retaining frame (bottom) for control units.
- Vehicles without retaining frame (bottom) for control units: Remove nuts.
- Vehicles with retaining frame (bottom) for control units: Take control unit for electromechanical parking brake - J540- off threaded pins.
- Slide retainer catch of electrical connection -2- forwards.
- Remove control unit for electromechanical parking brake - J540- -1- with connection.
- Unplug electrical connector and detach control unit.



### Installing

- Plug electrical connector -2- into control unit -J540- .
- Slide retainer catch on connector to the rear so it engages.
- Install control unit.
- If previously fitted, install retaining frame (bottom) for control units (3 Nm).
- When renewing control unit for electromechanical parking brake - J540- , select "Replace" function for control unit for electromechanical parking brake - J540- using ⇒ Vehicle diagnostic tester, **Guided Functions**.
- Fit side cap in luggage compartment (rear right).



### Tightening torques

- ◆ [Fig. ""Fitting location and tightening torque for control unit for electromechanical parking brake -J540- ""](#), page 199

### 3.3 Removing and installing parking brake motor -V282- / -V283-

Special tools and workshop equipment required

- ◆ Vehicle diagnostic tester
- ◆ Torque wrench - V.A.G 1331-



### Removing

- Release parking brake.
- Switch off ignition.



Note

*Switch off ignition for at least 30 seconds before disconnecting connector.*

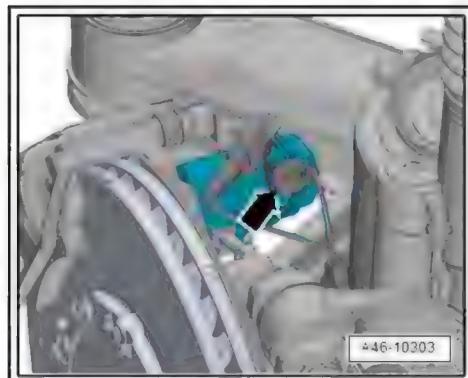
- Remove rear wheel: observe precautions for vehicles with ceramic brakes ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .



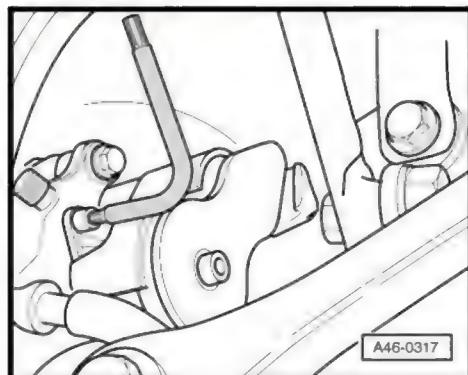
Note

*Clean whole area around connector and parking brake motor/brake caliper.*

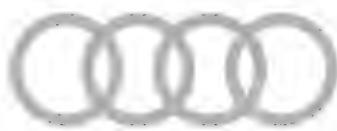
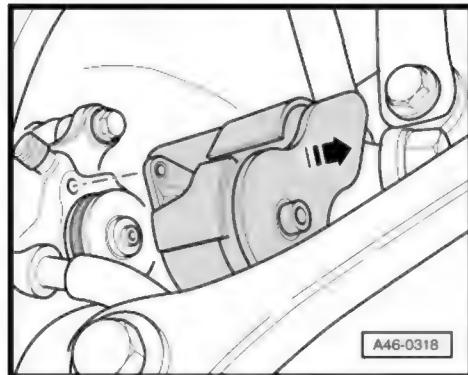
- Unplug electrical connector -arrow- on parking brake motor.



- Remove both bolts for parking brake motor.



- Take off parking brake motor -arrow-.



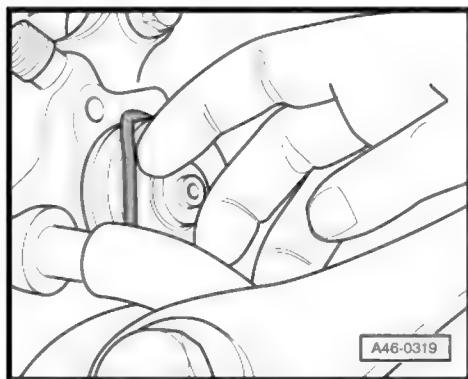
Information to support Audi original service and repair work. It gives technical instructions for maintenance, repair, removal and refitting of parts and is intended for professional users and persons with appropriate training. It does not guarantee the availability of parts or tools. It is not a substitute for information in the relevant Audi Service Manual. Copyright by AUDI AG.

- Remove seal with suitable tool.



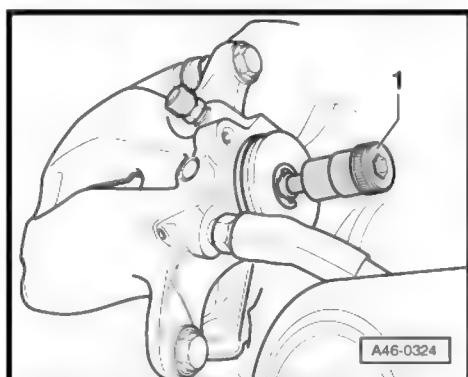
**Note**

- ◆ Take care not to damage the annular groove for the seal and the contact surface of the parking brake motor.
- ◆ Do not use tools with sharp edges.
- If necessary clean annular groove and contact surfaces. Use only brake cleaner.



**Installing**

- Fit new seal.
- If necessary, turn back adjusting screw in brake caliper slightly using socket -1- to facilitate installation of parking brake motor.



- Fit parking brake motor -arrow 1-.



**Note**

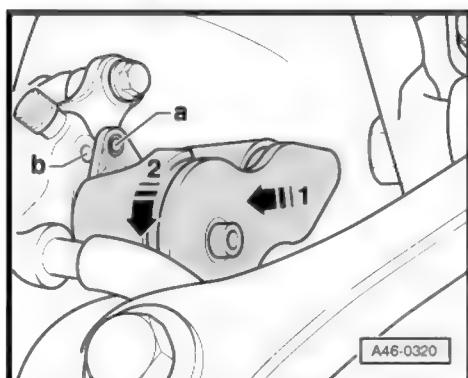
*Ensure that seal is fitted correctly.*

- Turn parking brake motor -arrow 2- to align bolt hole -a- with thread in brake caliper housing -b-.



**Note**

*Make sure the parking brake motor makes flush contact with the brake caliper housing.*

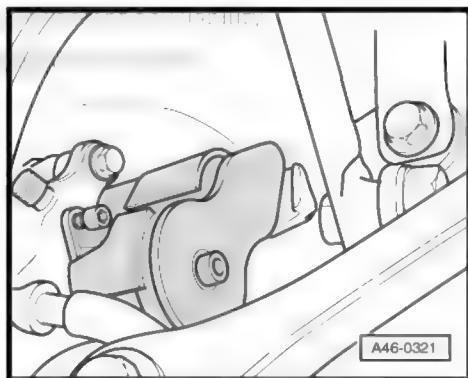


**Caution**

**Risk of damage to thread**

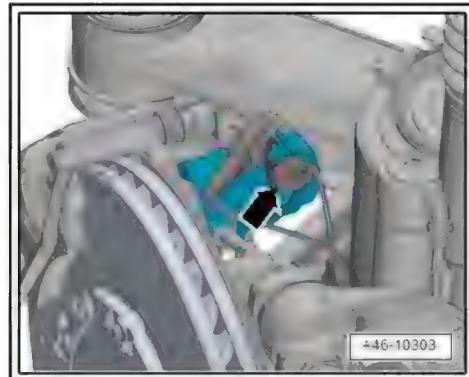
- ◆ Fit the bolts by hand and screw in several turns.
- ◆ If the thread is damaged the complete brake caliper has to be renewed.

- Tighten bolts for parking brake motor.



- Plug in electrical connector -arrow- on parking brake motor.
- Fit rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .
- Switch on ignition.
- After entering vehicle identification data, select **Guided Functions** mode.
- Perform basic setting:

Running gear/brake system	
01 Self-diagnosis compatible systems	
53 Control unit for electromechanical parking brake J540	
	53 Functions - electromechanical parking brake
	53 46 Basic setting



- Continue to follow the instructions on the vehicle diagnostic tester display.

#### Tightening torques

- ◆ ⇒ "3.1 Overview of fitting locations - parking brake",  
page 198

### 3.4 **Releasing parking brake manually**



Note

*A mechanical or electrical fault may make it necessary to release the parking brake mechanically in order to move the vehicle.*

#### Procedure



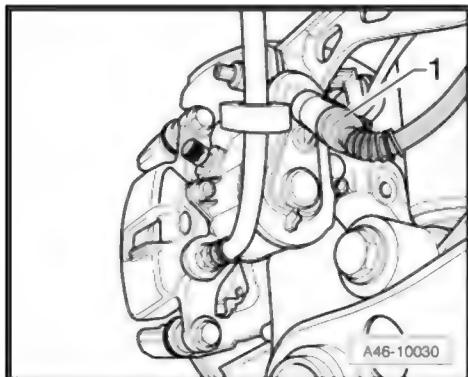
Note

*Perform the following procedure on each stationary rear wheel.*

	<b>WARNING</b>
<b>Risk of accident!</b>	
<ul style="list-style-type: none"> <li>◆ Before removing parking brake motor -V282- / -V283- , secure vehicle to prevent it from rolling.</li> </ul>	

- Remove rear wheel ⇒ Running gear, axles, steering; Rep. gr. 44 ; Wheels, tyres .

- Unplug electrical connector -1-.



- Unscrew both securing bolts -1- on actuator motor.

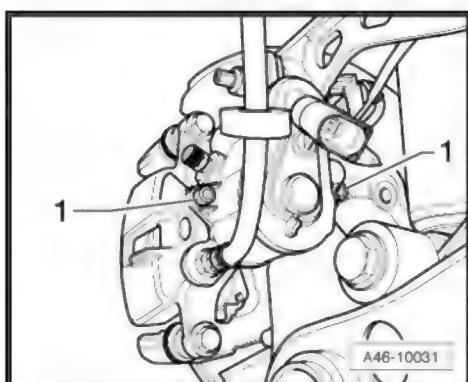


**WARNING**

*Risk of accident!*

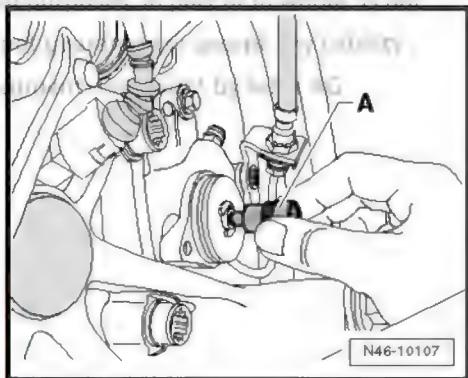
- ◆ Before removing parking brake motor -V282- / -V283- , secure vehicle to prevent it from rolling.

- Remove parking brake motor from brake caliper, turning parking brake motor back and forth slightly.
- Turn back drive shaft -item A- until brake is released.



**Note**

After repairing fault, install parking brake motor [⇒ page 200](#).



## 4 Brake pedal

⇒ "4.1 Exploded view - brake pedal", page 205

⇒ "4.2 Removing and installing mounting bracket", page 207

⇒ "4.3 Separating brake pedal from brake servo", page 210

⇒ "4.4 Connecting brake pedal to brake servo", page 211

⇒ "4.5 Removing and installing brake pedal", page 211

### 4.1 Exploded view - brake pedal



WARNING

*Risk of accident!*

- ◆ *The brake pedal travel must not be restricted by additional floor coverings.*



Note

*Apply grease, part number G 000 450 02, to all bearing and contact surfaces.*

**1 - Brake pedal**

- Separating from brake servo [⇒ page 210](#)
- Connecting to brake servo [⇒ page 211](#)
- Removing and installing [⇒ page 211](#)



**Caution**

If possible, leave the stop fitted on the brake pedal. The mounting for the brake light switch - F- could break off if the brake pedal is released too abruptly.

**2 - Securing clip**

- Renew after removing

**3 - Nuts**

- 8 Nm

**4 - Mounting bracket for pedal cluster**

- Removing and installing [⇒ page 207](#)

**5 - Pivot pin**

- For brake pedal

**6 - Securing clip**

- Renew after removing

**7 - Brake pedal position sender - G100-**

- With magnet carrier

- For vehicles with high-voltage system

- Removing and installing [⇒ page 53](#)

**8 - Bolt**

- 4.5 Nm

**9 - Bolt**

- Holds pivot pin in position

- 8 Nm

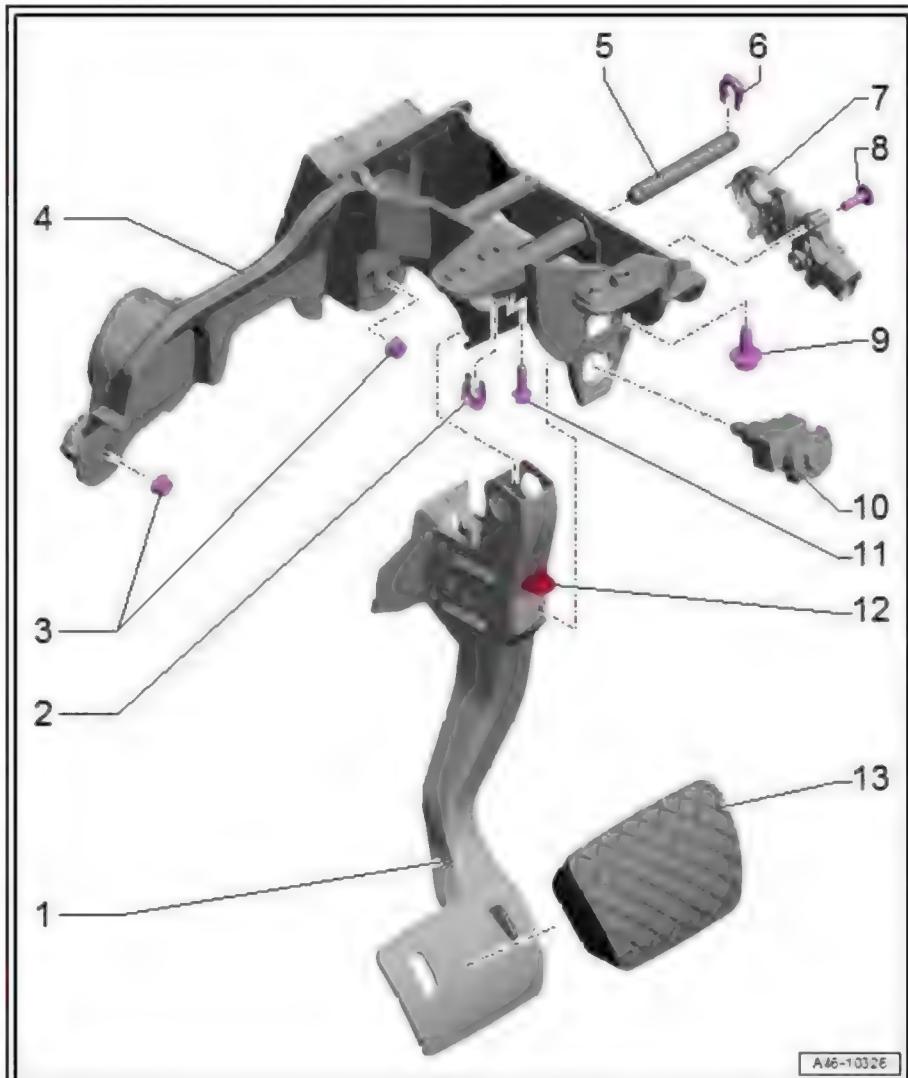
**10 - Brake light switch - F-**

- Removing and installing [⇒ page 51](#)

**11 - Bolt**

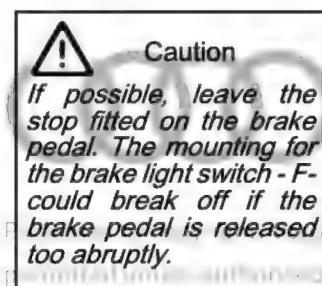
- Pedal bracket to steering column

- 20 Nm



A6-10326

## 12 - Stop



## 13 - Pedal rubber

### 4.2 Removing and installing mounting bracket

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



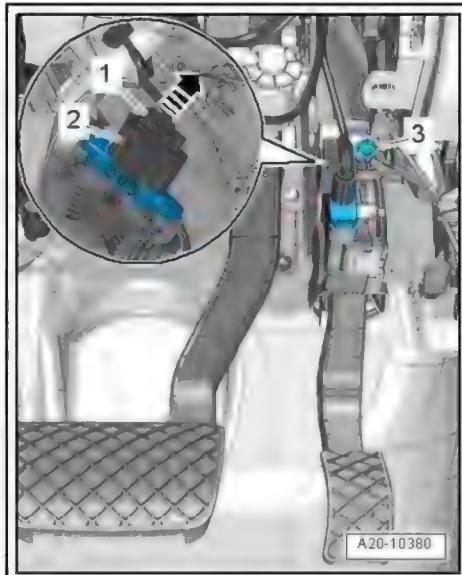
#### Removing

- Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Remove footwell vent ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side) .
- Separate brake pedal from brake servo ⇒ [page 210](#) .

- Press connector catch -1- upwards -arrow- and unplug electrical connector -2-.
- Move electrical wiring clear.



*Disregard -item 3-.*

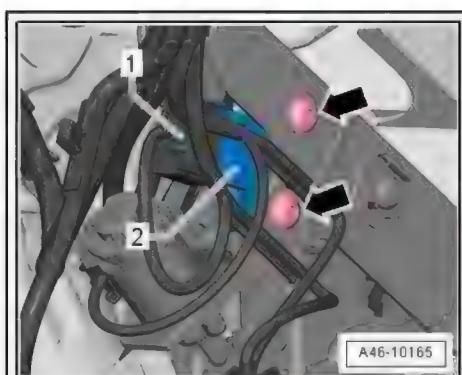


Vehicles with high-voltage system:

- Unplug electrical connector -1- at brake pedal position sender - G100- item 2-.

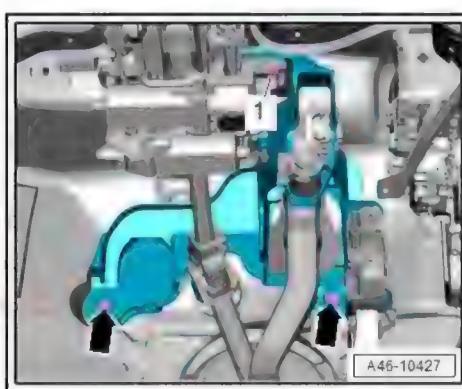


*Disregard -arrows-.*



All vehicles (continued):

- Remove nuts -arrows- and bolt -1-.
- Remove nuts for brake servo.



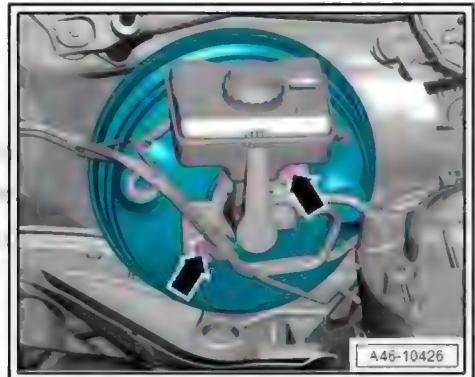


- Remove bolts -arrows- securing brake servo to mounting bracket.
- Detach mounting bracket (with brake pedal fitted) and accelerator pedal module.
- ~~Wert~~ - Remove brake pedal [⇒ page 211](#).
- ~~Wert~~ - Remove accelerator pedal module ⇒ Fuel supply system; Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender - G79- / -G185- .

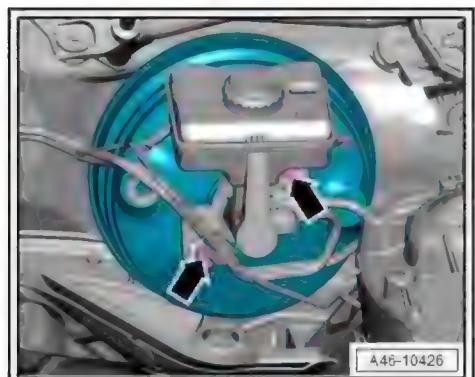
#### Installing

Installation is carried out in reverse order; note the following:

- Install accelerator pedal module ⇒ Fuel supply system; Rep. gr. 20 ; Accelerator mechanism; Removing and installing accelerator pedal module with accelerator position sender - G79- / -G185- .
- Install brake pedal [⇒ page 211](#).
- Insert pedal bracket with brake pedal and accelerator pedal module fitted.
- The pedal bracket must be seated in the guides on the bulkhead.
- Fit bolts -arrows- securing brake servo/mounting bracket and tighten.



A46-10426



A46-10426

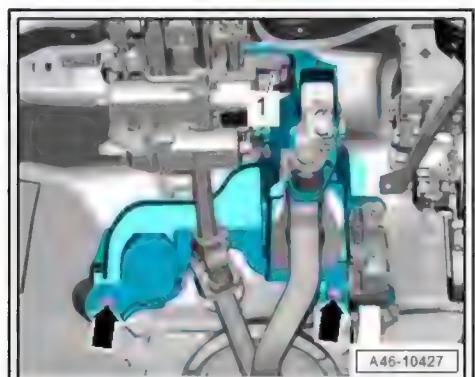
- Tighten nuts -arrows- and bolt -1-.
- Install footwell vent ⇒ Heating, air conditioning; Rep. gr. 87 ; Air duct system; Removing and installing footwell vent (driver side) .
- Connect brake pedal to brake servo [⇒ page 211](#) .
- Install body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .



#### WARNING

*Risk of accident!*

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*



A46-10427

#### Tightening torques

- ◆ [⇒ "4.1 Exploded view - brake pedal", page 205](#)

#### 4.3 Separating brake pedal from brake servo



##### Caution

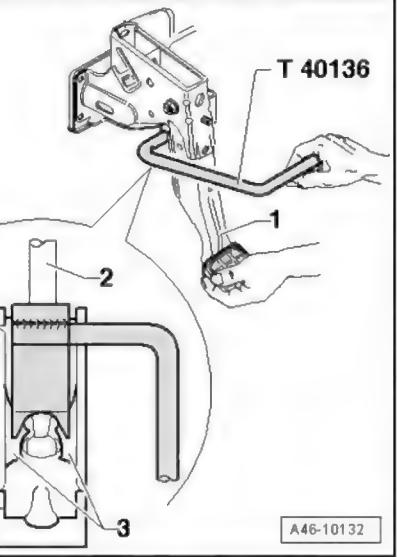
If possible, leave the stop fitted on the brake pedal. The mounting for the brake light switch - F- could break off if the brake pedal is released too abruptly.

Special tools and workshop equipment required

- ◆ Release tool - T40136-



W00-107.38



##### Procedure

- Remove brake light switch - F- [page 51](#).
- First press brake pedal in direction of brake servo and hold.
- Insert release tool - T40136- and pull towards driver's seat, at the same time holding brake pedal -1- in position to stop it moving towards the rear. This will press the retaining lugs -3- of the mounting off the ball head of the push rod -2-.



For ease of illustration, components are shown with pedal cluster removed.

- Pull release tool - T40136- and brake pedal together towards driver's seat (this will pull the brake pedal off the ball head of the push rod).

## 4.4 Connecting brake pedal to brake servo

### Procedure

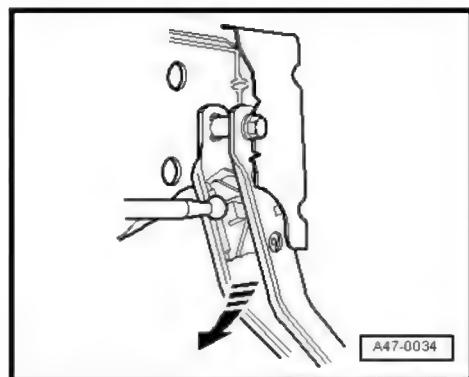
- Hold ball head of push rod in front of mounting and push brake pedal towards brake servo -arrow- until ball head audibly locks into place.
- Install brake light switch - F- [page 51](#).



#### WARNING

*Risk of accident!*

- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



A47-0034

## 4.5 Removing and installing brake pedal

### Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1410-

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#### V.A.G 1410



W00-11174

### Removing

Vehicles with manual gearbox:

- Remove mounting bracket [page 207](#).

All vehicles (continued):

- Slacken retaining bolt -3- for pin.
- Pull both securing clips -1- off pin.
- Slide pin -5- out of brake pedal -2- and mounting bracket -4-.
- Take off brake pedal.

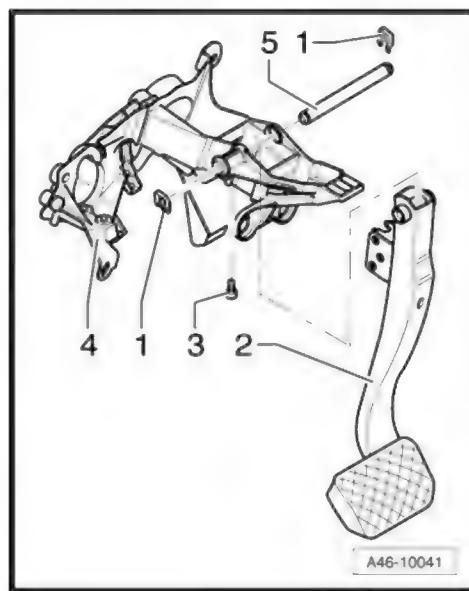
### Installing



#### Caution

If possible, leave the stop fitted on the brake pedal. The mounting for the brake light switch - F- could break off if the brake pedal is released too abruptly.

- Push retaining clip (right-side) onto pin.
- Slide pin from right to left through shaft in brake pedal.



A46-10041

- Secure pin with retaining clip -1- on left side.
- The pin must be secured with the retaining clips on both sides.
- Fit bolt -3- and tighten.
- Install mounting bracket [⇒ page 207](#).



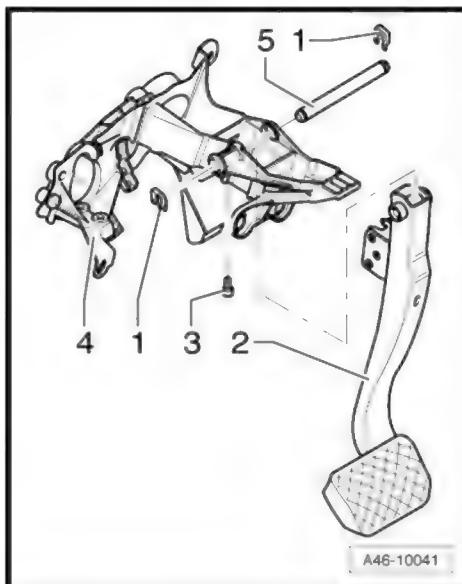
**WARNING**

*Risk of accident!*

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

**Tightening torques**

- ◆ [⇒ "4.1 Exploded view - brake pedal", page 205](#)



47 – Brakes - hydraulics

## 1 Front brake caliper

⇒ “1.1 Exploded view - front brake caliper”, page 213

⇒ “1.2 Removing and installing brake caliper piston”, page 216

⇒ “1.3 Renewing bearing bushes and guide pins”, page 226

## 1.1 Exploded view - front brake caliper

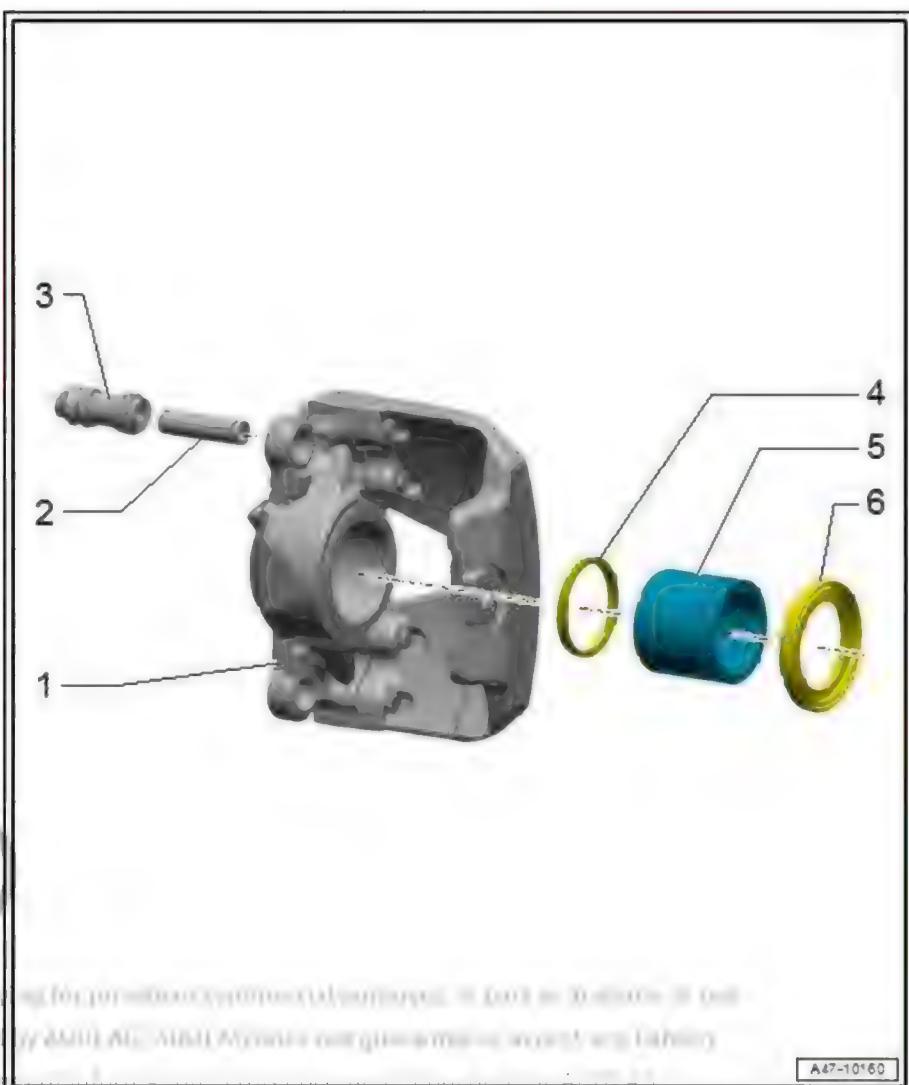
⇒ “1.1.1 Exploded view - front brake caliper (1LA/1LJ)”,  
page 213

⇒ “1.1.3 Exploded view - front brake caliper (1LF/1LL)”,  
page 214

⇒ "1.1.5 Exploded view - front brake caliper (1LU/1LM/1LX/1LW/1LN)", page 215

### 1.1.1 Exploded view - front brake caliper (1LA/1LJ)

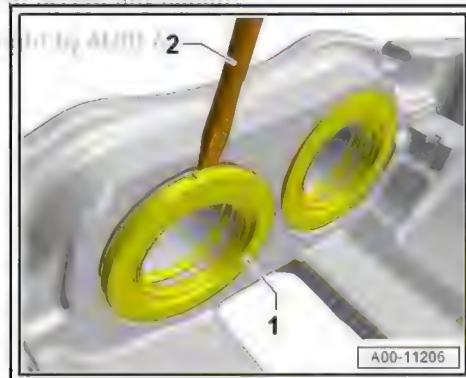
- 1 - Brake caliper
- 2 - Guide pin
  - Bolt, 2x
  - Renewing [⇒ page 226](#)
- 3 - Bearing bush
  - Bolt, 2x
  - Renewing [⇒ page 226](#)
- 4 - Seal
- 5 - Brake caliper piston
  - Removing and installing  
[⇒ page 216](#)
  - Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"
- 6 - Protective cap
  - If damaged, install all parts supplied in repair kit ⇒ Electronic parts catalogue "ETKA".



### 1.1.2 Removing protective cap and seal

Removal tool - VAS 40338-

- Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool -VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



### 1.1.3 Exploded view - front brake caliper (1LF/1LL)

1 - Brake caliper

2 - Bearing bush

- Bolt, 2x
- Renew if damaged  
⇒ [page 227](#)

3 - Protective cap

- Bolt, 2x
- Press onto bearing bush

4 - Seal

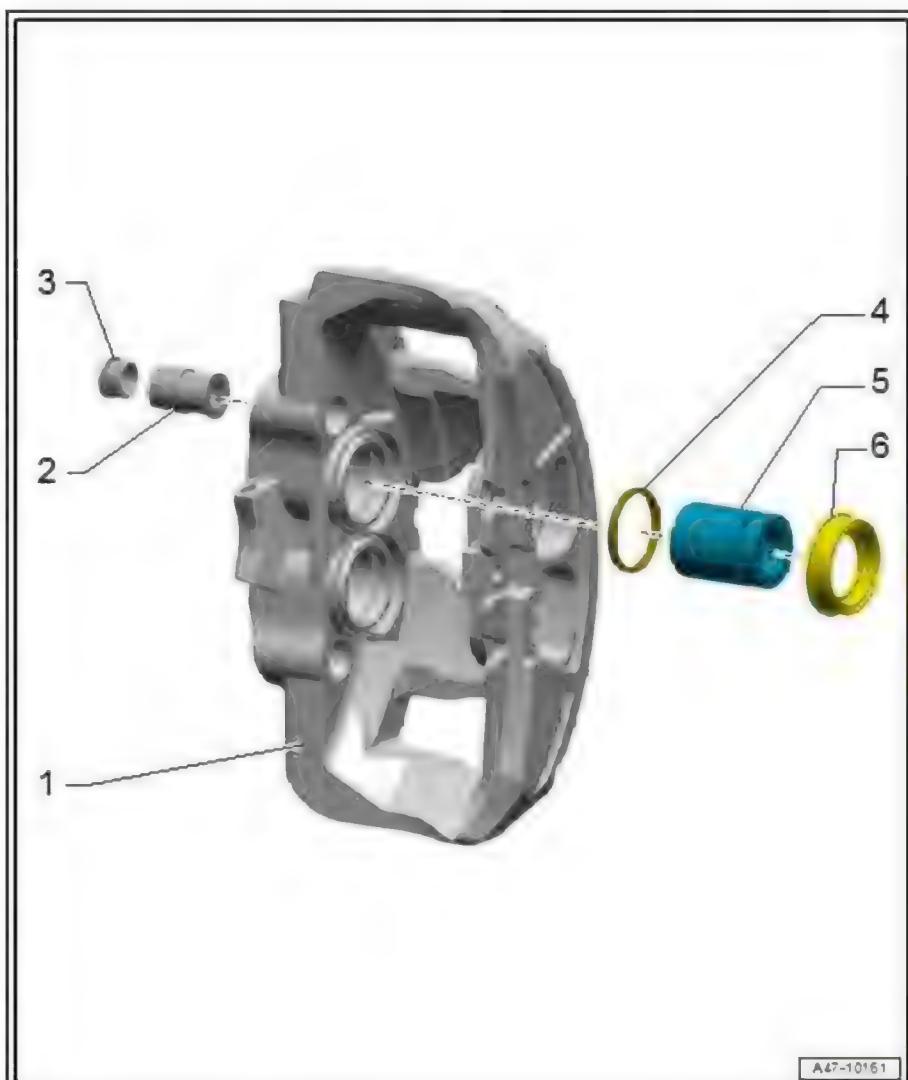
- Bolt, 2x
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"

5 - Brake caliper piston

- Bolt, 2x
- Removing and installing  
⇒ [page 219](#)
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"

6 - Protective cap

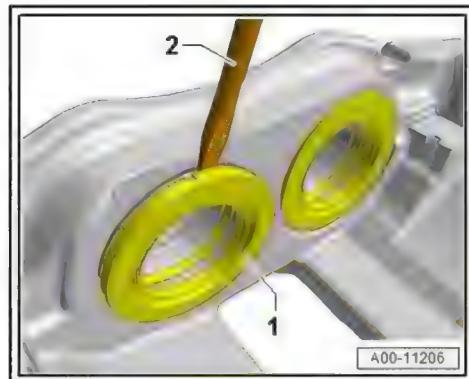
- Bolt, 2x
- If damaged, install all parts supplied in repair kit ⇒ Electronic parts catalogue "ETKA".
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"



### 1.1.4 Removing protective cap and seal

Removal tool - VAS 40338-

- Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



### 1.1.5 Exploded view - front brake caliper (1LU/1LM/1LX/1LW/1LN)

1 - Brake caliper

2 - Seal

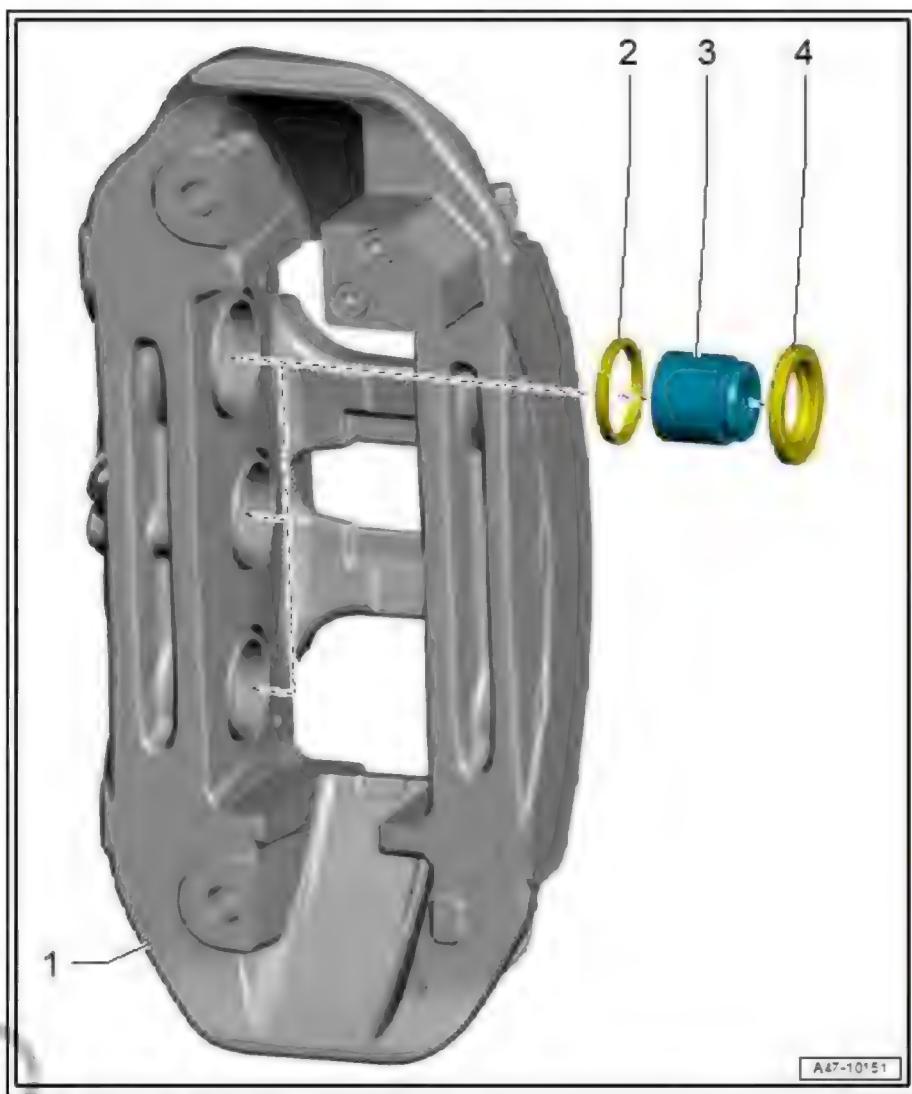
- 6x
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"

3 - Brake caliper piston

- 6x
- Removing and installing ⇒ [page 223](#)
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"

4 - Protective cap

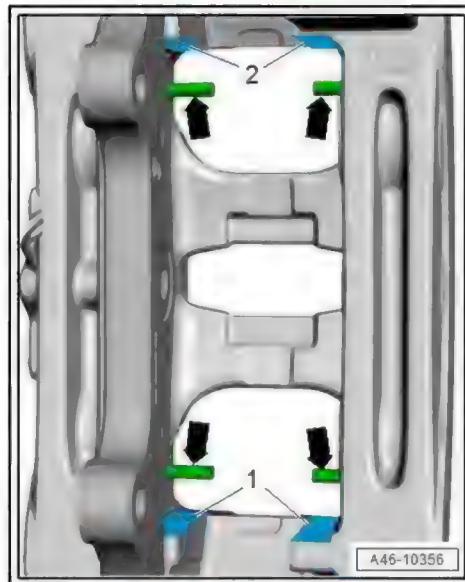
- 6x
- If damaged, install all parts supplied in repair kit ⇒ Electronic parts catalogue "ETKA".
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"



**Caution**

The guide pins for the brake pads on the brake calipers may be loosened for ceramic brakes (PR number 1LW) only.

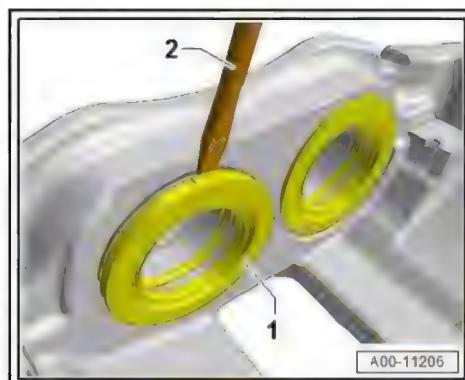
Tightening torque for guide pins -arrows- (brakes 1LW): 24 Nm



### 1.1.6 Removing protective cap and seal

Removal tool - VAS 40338-

- Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



## 1.2 Removing and installing brake caliper piston

⇒ “1.2.1 Removing and installing brake caliper piston (1LA/1LJ)”, page 216

⇒ “1.2.2 Removing and installing brake caliper piston (1LF/1LL)”, page 219

⇒ “1.2.3 Removing and installing brake caliper piston (1LU/1LM/1LX/1LN/1LW)”, page 223

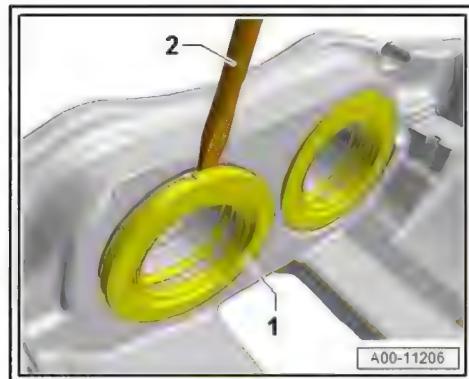
### 1.2.1 Removing and installing brake caliper piston (1LA/1LJ)

Removing

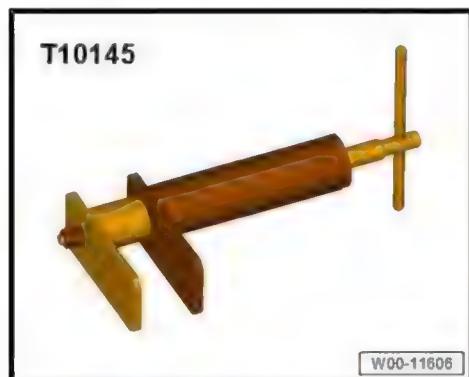
Special tools and workshop equipment required

- ◆ Assembly paste - G 052 150 A2-
- ◆ Removal tool - VAS 40338-

- ◆ Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



- ◆ Piston resetting appliance - T10145-



- ◆ Safety goggles



- ◆ Protective gloves

- ◆ Lithium grease ⇒ Electronic parts catalogue "ETKA"

#### Removing

- Remove brake caliper and disconnect from hydraulic system  
⇒ page 124.
- Clamp brake caliper in jaws of vice. Use protective jaw covers.



#### WARNING

*Risk of injury.*

- ◆ Put on safety goggles.
- ◆ When pressing out brake caliper piston, DO NOT reach into brake caliper with your fingers.
- ◆ Place a cloth over bore in brake caliper to catch any brake fluid spatter. Wrap another cloth tightly around nozzle of compressed-air gun applied to brake caliper.
- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.



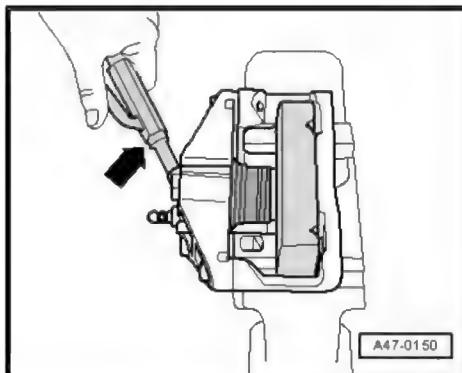
#### Note

- ◆ Take care not to damage paint coating on brake caliper.
- ◆ Take care not to damage cylinder surface.
- Place a piece of wood in the caliper to prevent damage to the piston when it is forced out.

Removal tool - VAS 40338-

- Carefully lever protective cap -1- out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.
- Apply compressed air nozzle to threaded hole for brake hose -arrow- and press piston out of caliper.

Removal tool - VAS 40338-



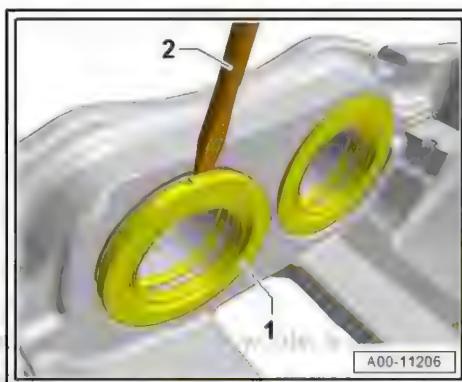
- Carefully lever seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.

Installing

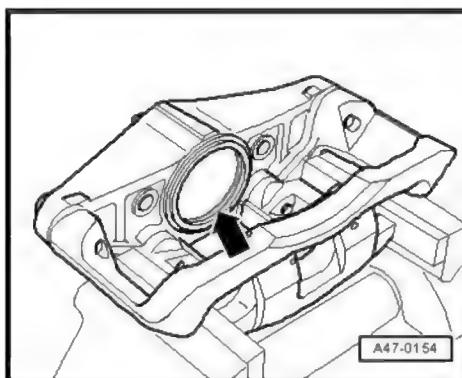


Note

- ◆ *Install all parts supplied in repair kit.*
- ◆ *Use only methylated spirits to clean the brake components.*
- ◆ *The brake caliper must be replaced if a brake caliper piston or piston bore is damaged.*



- The surfaces of the brake caliper piston and seal must be cleaned only with methylated spirits and then dried.
- Before inserting, apply thin coat of lithium grease to brake caliper piston and seal.
- Insert inner seal into groove -arrow- in brake caliper.



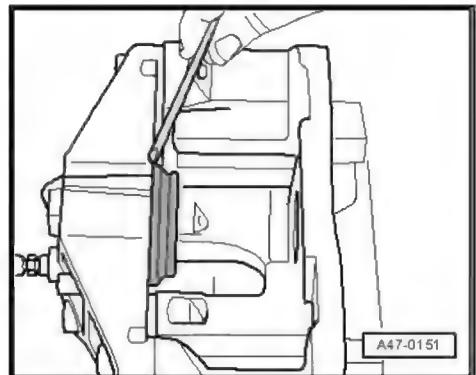
- Push protective cap onto brake caliper housing and press it in so that it makes contact all round.
- At this stage it should not be possible to remove the protective cap from the brake caliper housing by hand.



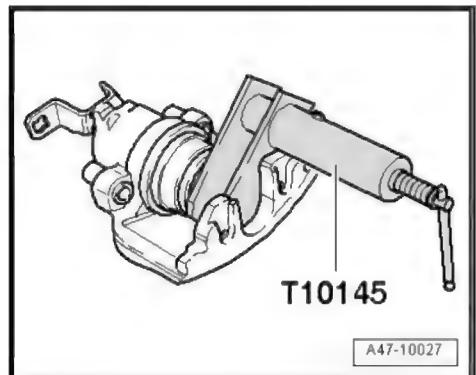
**Caution**

*Risk of damage to protective cap and seal.*

- ◆ Take care to keep brake caliper piston straight.



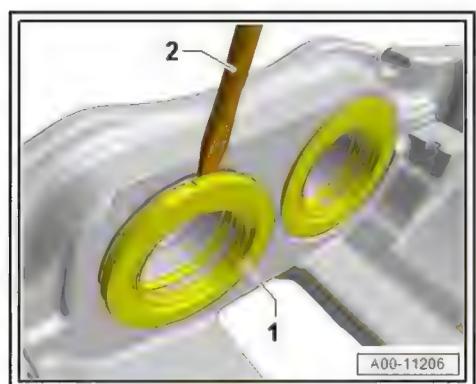
- Press brake caliper piston lightly against protective cap.
- Inflate protective cap using nozzle of compressed air gun (maximum 3 bar).
- This will make the protective cap slip onto the brake caliper piston.
- Press brake caliper piston into caliper using piston resetting appliance - T10145- .
- The inner sealing lip on the protective cap will then locate in the groove in the brake caliper piston.
- Install brake caliper [⇒ page 124](#) .



## 1.2.2 Removing and installing brake caliper piston (1LF/1LL)

Special tools and workshop equipment required

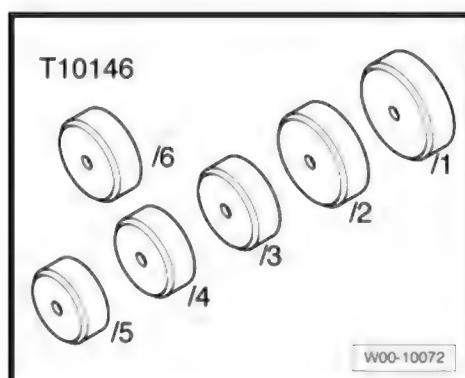
- ◆ Removal tool - VAS 40338-
- ◆ Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



◆ Piston resetting appliance - T10145-



◆ -T10146/5- from assembly tool - T10146-



- ◆ Safety goggles
- ◆ Protective gloves
- ◆ Lithium grease ⇒ Electronic parts catalogue "ETKA"

Removing

- Remove brake caliper and disconnect from hydraulic system  
⇒ [page 124](#).
- Clamp brake caliper in jaws of vice. Use protective jaw covers.



**WARNING**

*Risk of injury.*

- ◆ Put on safety goggles.
- ◆ When pressing out brake caliper piston, DO NOT reach into brake caliper with your fingers.
- ◆ Place a cloth over bore in brake caliper to catch any brake fluid spatter. Wrap another cloth tightly around nozzle of compressed-air gun applied to brake caliper.
- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.

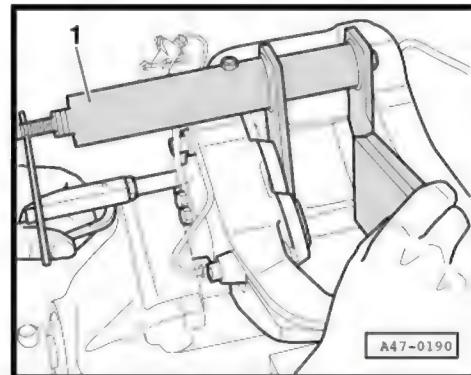


Note

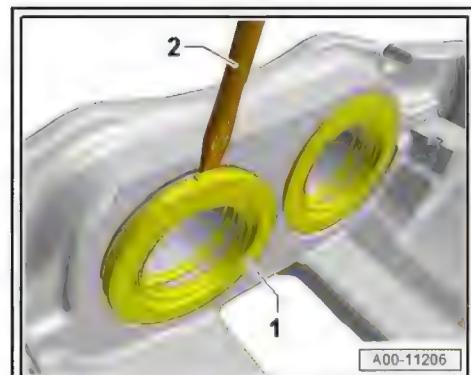
- ◆ Take care not to damage paint on brake caliper when removing brake caliper pistons and protective caps.
- ◆ When removing ensure that the bore of the cylinder is not damaged.
- ◆ The brake caliper pistons can only be removed one at a time.

- Use the piston resetting appliance - T10145- -item 1- to hold the second brake caliper piston in place in the brake caliper.
- Place a piece of wood in the caliper to prevent damage to the piston when it is forced out.

Removal tool - VAS 40338-



- Carefully lever protective cap -1- out of brake caliper with gentle movements using removal tool - VAS 40338--2-; take care not to damage groove for protective cap in brake caliper.



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- Apply compressed air nozzle to threaded hole for brake hose and press piston out of caliper.

1 - Piston resetting appliance - T10145-

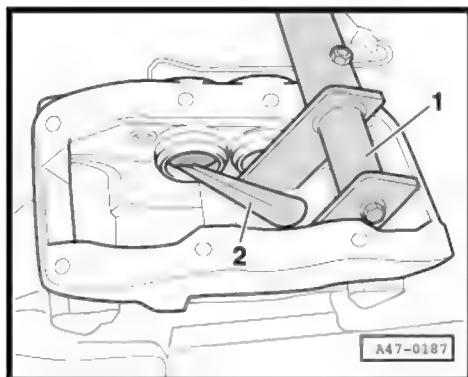
- Carefully lever seal out of brake caliper with gentle movements using removal tool - VAS 40338- 2-; take care not to damage groove for protective cap in brake caliper.

**Installing**

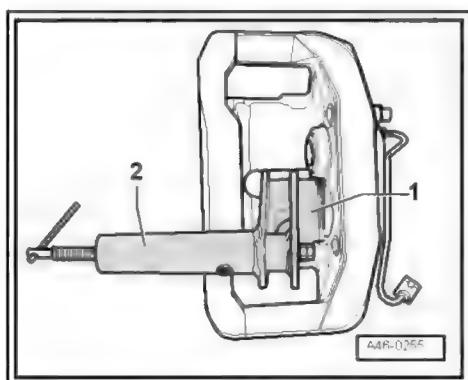


**Note**

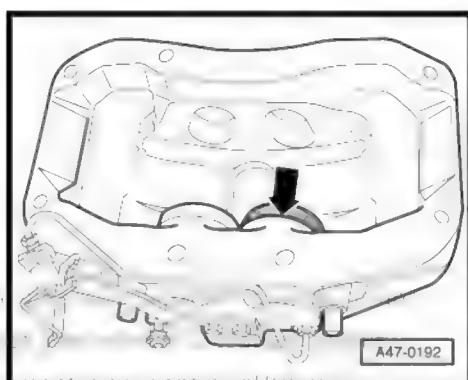
- ◆ *Install all parts supplied in repair kit.*
- ◆ *Use only methylated spirits to clean the brake components.*
- ◆ *The brake caliper must be replaced if a brake caliper piston or piston bore is damaged.*



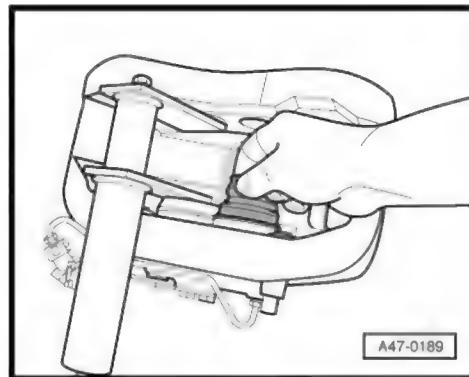
- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Before inserting, apply thin coat of lithium grease to brake caliper piston and seal.
- Using removal wedge - 3409- , insert inner seal into groove of brake caliper.
- Fit protective cap using assembly tool for protective caps - T10146/5- -item 1- and piston resetting appliance - T10145- -item 2-.



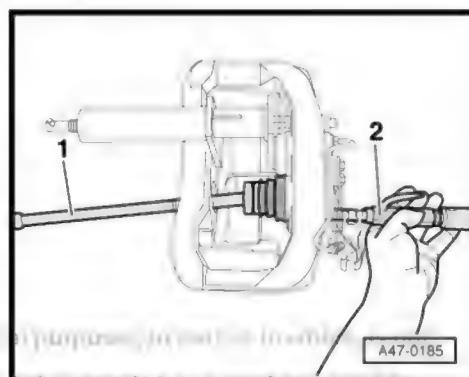
- Push protective cap onto brake caliper housing and press it in so that it is seated flush all round -arrow-.



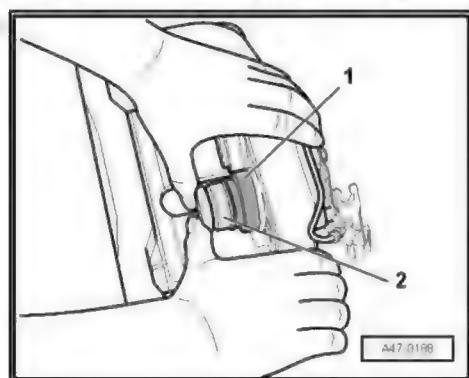
- At this stage it should not be possible to remove the protective cap from the brake caliper housing by hand.
- Before inserting, apply thin coat of lithium grease to piston and protective cap.



- Hold brake caliper piston with standard extension -1- and ratchet attachment and press lightly onto protective cap, as shown in illustration.
- Keep the piston straight to avoid damaging the seal.
- Apply compressed air nozzle -2- to threaded hole for brake hose and blow air into protective cap with no more than 3 bar so that cap springs onto piston.



- Press piston -2- into brake caliper housing by hand.
- The inner sealing lip on the protective cap -1- will then locate in the piston groove.
- Repeat the procedure on the other brake caliper piston.
- Install brake caliper [page 124](#).



### 1.2.3 Removing and installing brake caliper piston (1LU/1LM/1LX/1LN/1LW)



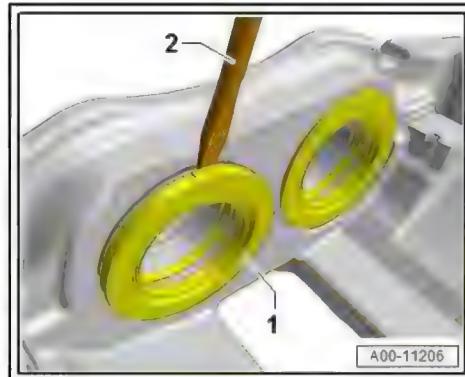
Note

*Procedure for steel version brakes and ceramic brakes is identical.*

Special tools and workshop equipment required

- ◆ Assembly paste - G 052 150 A2-
- ◆ Removal tool - VAS 40338-

- ◆ Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



- ◆ Piston resetting appliance - T10145-



- ◆ Safety goggles
- ◆ Protective gloves
- ◆ Lithium grease ⇒ Electronic parts catalogue "ETKA"

#### Removing

- Remove brake caliper and disconnect from hydraulic system  
[⇒ page 124](#).
- Clamp brake caliper in jaws of vice. Use protective jaw covers.



#### WARNING

*Risk of injury.*

- ◆ Put on safety goggles.
- ◆ When pressing out brake caliper piston, DO NOT reach into brake caliper with your fingers.
- ◆ Place a cloth over bore in brake caliper to catch any brake fluid spatter. Wrap another cloth tightly around nozzle of compressed-air gun applied to brake caliper.
- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.

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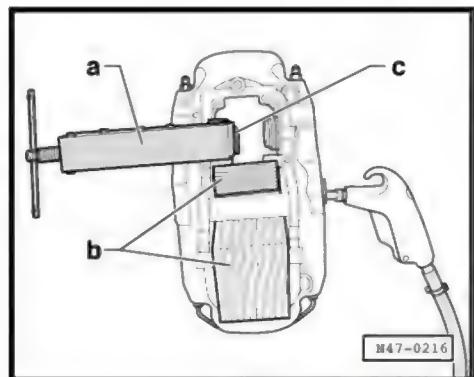
**Note**

- ◆ Take care not to damage paint on brake caliper when removing brake caliper pistons and protective caps.

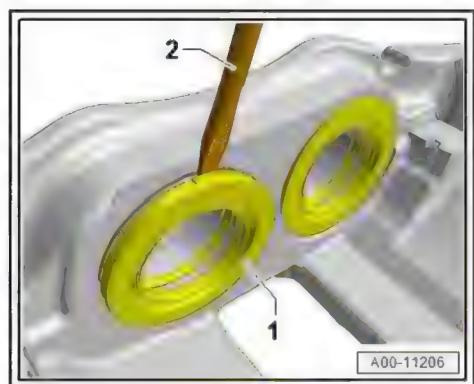
- ◆ The brake caliper pistons can only be removed one at a time.

- Use the piston resetting appliance - T10145- -item a- to hold the opposite brake caliper piston in place in the brake caliper.
- To avoid damaging the paint on the caliper, insert a piece of rubber between the piston resetting appliance - T10145- and the caliper.
- Use blocks of wood or similar -b- to keep the other pistons in place. Also place a piece of wood -c- against the piston resetting appliance - T10145- to prevent the brake caliper piston from being damaged when it is forced out.

Removal tool - VAS 40338-



- Carefully lever protective cap -1- out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



- Apply compressed air nozzle to threaded hole for brake hose and press piston out of caliper.

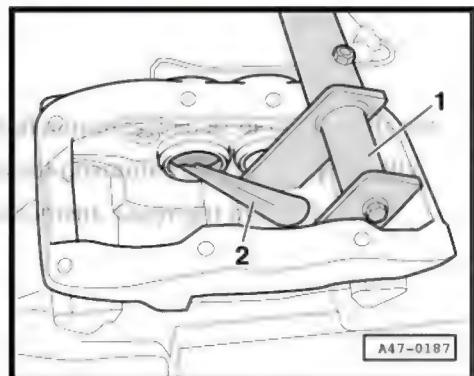
1 - Piston resetting appliance - T10145-

- Carefully lever seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.

Installing

 Note

- ◆ *Install all parts supplied in repair kit.*
- ◆ *Use only methylated spirits to clean the brake components.*
- ◆ *The brake caliper must be replaced if a brake caliper piston or piston bore is damaged.*



- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Before inserting, apply thin coat of lithium grease to brake caliper piston and seal.

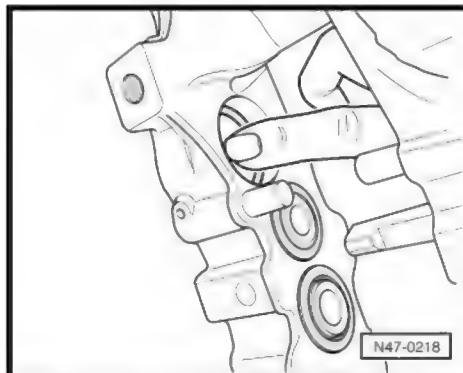
- Insert seal in brake caliper.



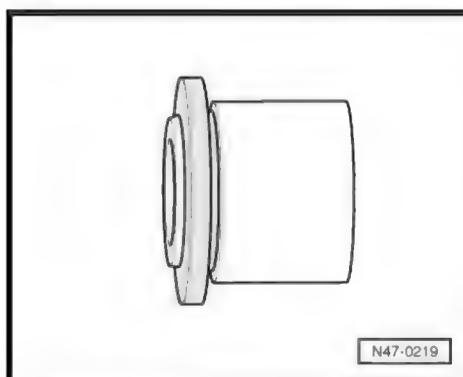
**Caution**

*Risk of damage to brake caliper pistons for ceramic brakes*

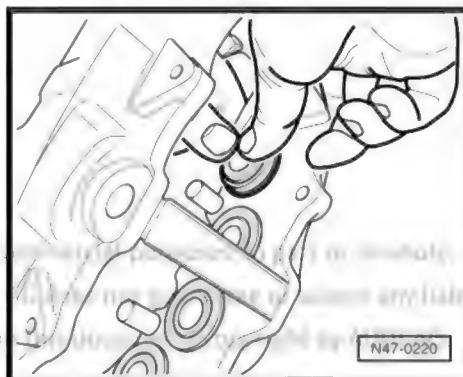
- ◆ *The ceramic inserts on the brake caliper piston act as heat insulators and must not be separated from the brake caliper piston. If the ceramic insert is damaged, the brake caliper piston must be renewed for safety reasons.*



- Fit protective cap onto brake caliper piston.



- Push piston into caliper, exerting even pressure and making sure piston is straight.
- Press protective cap into groove on brake caliper.
- The protective cap must be securely seated in the groove. If necessary, press in further using piston resetting appliance - T10145 - .
- Repeat procedure on next brake caliper piston.
- Install brake caliper [⇒ page 124](#).



### 1.3 Renewing bearing bushes and guide pins

⇒ “[1.3.1 Renewing bearing bushes and guide pins - steel version brakes \(1LA/1LJ\)](#)”, page 226

⇒ “[1.3.2 Renewing bearing bushes and guide pins - steel version brakes \(1LF/1LL\)](#)”, page 227

#### 1.3.1 Renewing bearing bushes and guide pins - steel version brakes (1LA/1LJ)

Special tools and workshop equipment required

- ◆ Lithium grease ⇒ Electronic parts catalogue

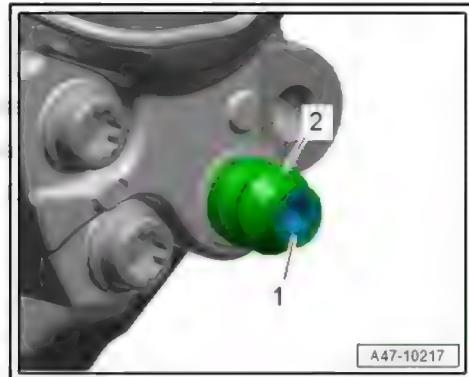
Removing

- Remove brake pads [⇒ page 79](#).

- On outside, pull bearing bush -2- out of groove in guide pin -1-.
- Pull guide pin outwards out of bearing bush.
- Pull bearing bush out of brake caliper.

#### Installing

- Apply a small amount of grease (from repair kit) to guide pin.
- Carefully push guide pin into bearing bush as far as first groove.
- Insert bearing bush into brake caliper.
- Bearing bush must be seated centrally in brake caliper.
- Push guide pin through bearing bush.
- The bearing bush must now be seated in both grooves on the guide pin.
- Check that both guide pins move easily.
- It should be possible to slide both guide pins in and out.
- Install brake pads [⇒ page 79](#).



A47-10217

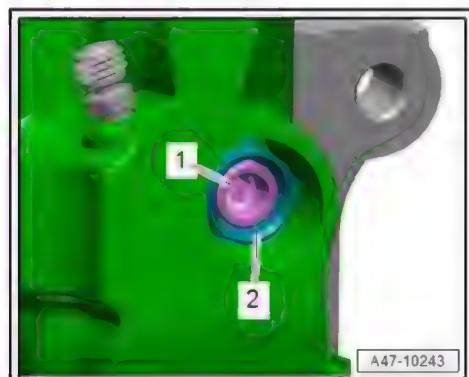
### 1.3.2 Renewing bearing bushes and guide pins - steel version brakes (1LF/1LL)

Special tools and workshop equipment required

- ◆ Lithium grease ⇒ Electronic parts catalogue

#### Removing

- Remove brake pads [⇒ page 84](#).
- Pull guide pin -1- outwards out of bearing bush.
- Pull bearing bush -2- out of brake caliper.
- Insert bearing bush into brake caliper.
- Bearing bush must be seated centrally in brake caliper.
- Apply a small amount of grease (from repair kit) to guide pin.
- Push guide pin into bearing bush.
- Check that both guide pins move easily.
- It should be possible to slide both guide pins in and out.
- Install brake pads [⇒ page 84](#).



A47-10243

## 2 Rear brake caliper

- ⇒ “2.1 Exploded view - rear brake caliper”, page 228
- ⇒ “2.2 Removing and installing brake caliper piston”, page 228

### 2.1 Exploded view - rear brake caliper

1 - Bolt

- Tightening torque  
⇒ Item 6 (page 154)

2 - Brake caliper housing

3 - Bleeder screw

- Tightening torque  
⇒ Item 4 (page 154)

4 - Dust cap

5 - Seal

- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"

6 - Compressor nut

- To operate parking brake

7 - Brake caliper piston

- Removing and installing ⇒ page 228
- Apply a small amount of lithium grease ⇒ Electronic parts catalogue "ETKA"

8 - Guide pin

- Lubricate before installing bearing bush
- Replacement parts are supplied with sufficient grease

9 - Bearing bush

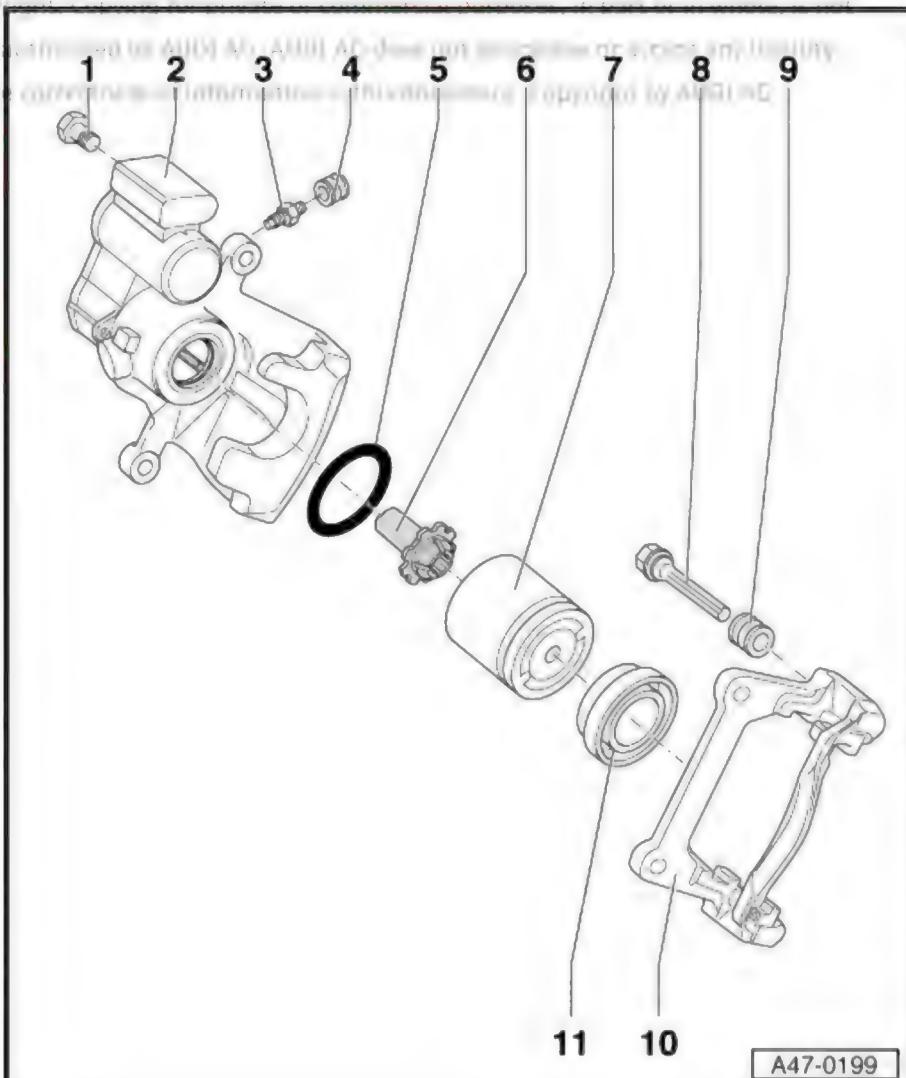
- Fit onto brake carrier and guide pin

10 - Brake carrier

- With guide pin(s) and bearing bush
- Replacement carriers are supplied assembled and with sufficient grease on guide pins
- If protective caps or guide pins are damaged, renew using repair kit. Use grease sachet supplied to lubricate the guide pins.

11 - Protective cap

- Removing and installing ⇒ page 228



### 2.2 Removing and installing brake caliper piston

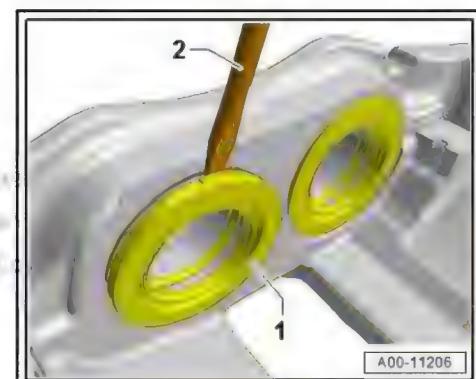
Special tools and workshop equipment required

- ◆ Removal wedge - 3409-



- ◆ Removal tool - VAS 40338-

- ◆ Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.



- ◆ Piston resetting appliance - T10145-



- ◆ Safety goggles
- ◆ Protective gloves
- ◆ Lithium grease ⇒ Electronic parts catalogue "ETKA"

#### Removing

- Remove brake caliper and disconnect from hydraulic system  
⇒ page 179.
- Clamp brake caliper in jaws of vice. Use protective jaw covers.



### WARNING

*Risk of injury.*

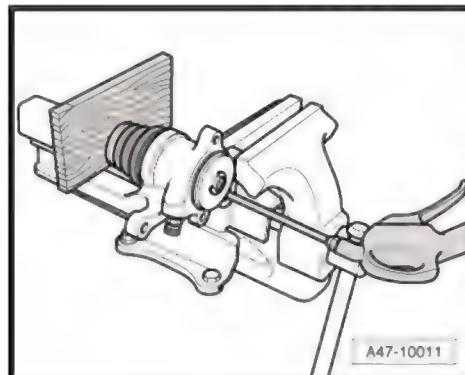
- ◆ *Put on safety goggles.*
- ◆ *When pressing out brake caliper piston, DO NOT reach into brake caliper with your fingers.*
- ◆ *Place a cloth over bore in brake caliper to catch any brake fluid spatter. Wrap another cloth tightly around nozzle of compressed-air gun applied to brake caliper.*
- ◆ *Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.*



### Note

- ◆ *Take care not to damage paint on brake caliper when removing brake caliper piston and protective cap.*
- ◆ *When removing ensure that the bore of the cylinder is not damaged.*
- Screw piston out of brake caliper as far as possible.
- Place a piece of wood in the caliper to prevent damage to the piston when it is forced out.
- Apply compressed air nozzle to threaded hole for brake hose and press piston out of caliper.

Removal tool - VAS 40338-



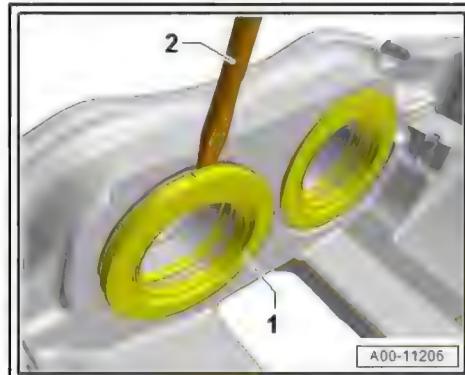
Carefully lever protective cap -1- and seal out of brake caliper with gentle movements using removal tool - VAS 40338- -2-; take care not to damage groove for protective cap in brake caliper.

### Installing

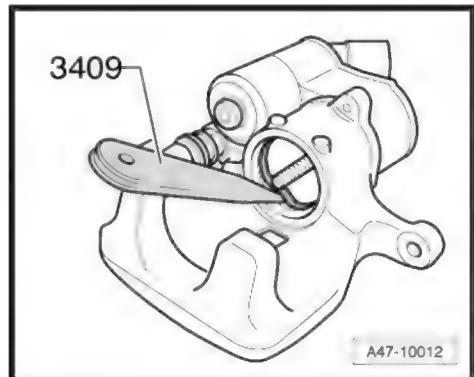


### Note

- ◆ *Install all parts supplied in repair kit.*
- ◆ *Use only methylated spirits to clean the brake components.*
- ◆ *The brake caliper must be replaced if a brake caliper piston or piston bore is damaged.*
- The surfaces of the piston and seal must be cleaned only with methylated spirits and then dried.
- Before inserting, apply thin coat of lithium grease to brake caliper piston and seal.

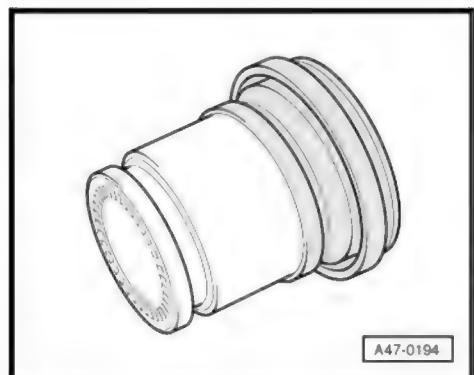


- Fit seal in brake caliper using removal wedge - 3409- .



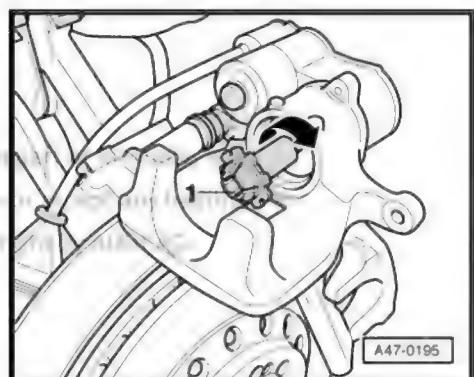
A47-10012

- Fit protective cap onto brake caliper piston, as shown in illustration.



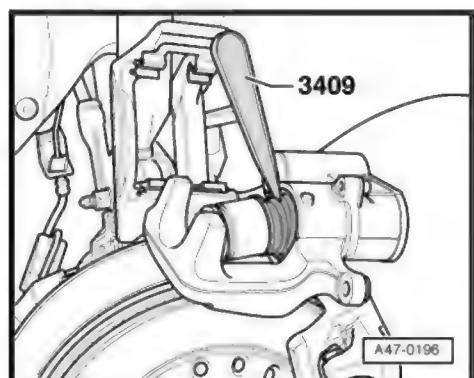
A47-0194

- Screw compressor nut -1- clockwise into brake caliper -arrow- as far as stop and then slacken off by a quarter turn.



A47-0195

- Fit protective cap into groove in brake caliper using removal wedge - 3409- .
- Carefully press piston into brake caliper, moving piston as required.
- The brake caliper piston must be guided over the compressor nut.

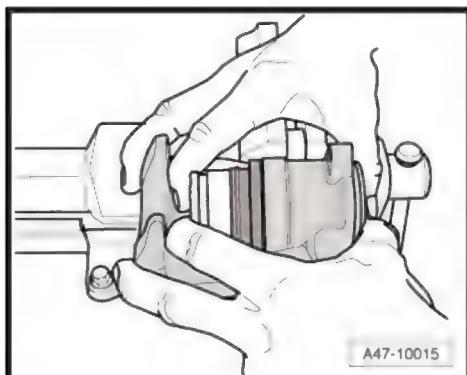


A47-0196

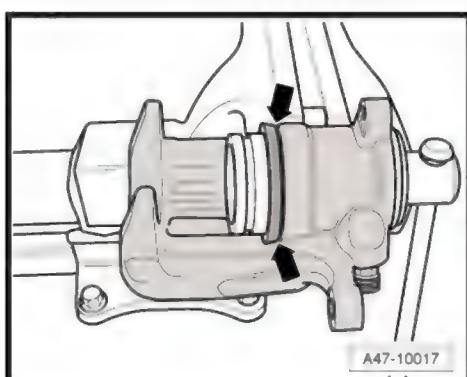
- After guiding brake caliper piston onto compressor nut, press piston into brake caliper as far as stop.



*Take care not to damage the compressor nut.*



- The seal must fit flush in the brake caliper all round -arrows-.

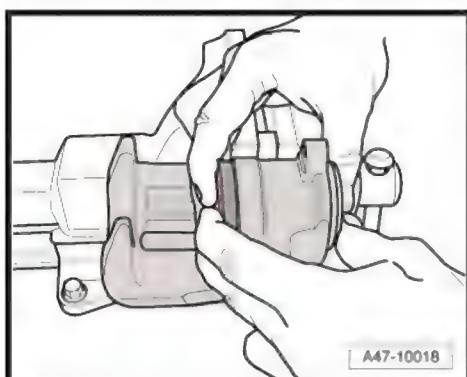


- Press piston into brake caliper by hand.
- The inner sealing lip on the protective cap will then locate in the piston groove.



- ◆ You can also use piston resetting appliance - T10145- to press in the brake caliper piston.
- ◆ Make sure that the protective cap is located in the groove of the brake caliper piston when the piston is pressed in all the way.

- Install brake caliper [⇒ page 179](#).



Important information: During further work on universal parts, always use the correct tools and torque values! The AUDI AG has a global network of trained service facilities. For more detailed information please contact your nearest AUDI dealer.

### 3 Brake servo / brake master cylinder

⇒ "3.1 Exploded view - brake servo / brake master cylinder", page 233

⇒ "3.2 Removing and installing brake servo", page 234

⇒ "3.3 Removing and installing brake master cylinder", page 237

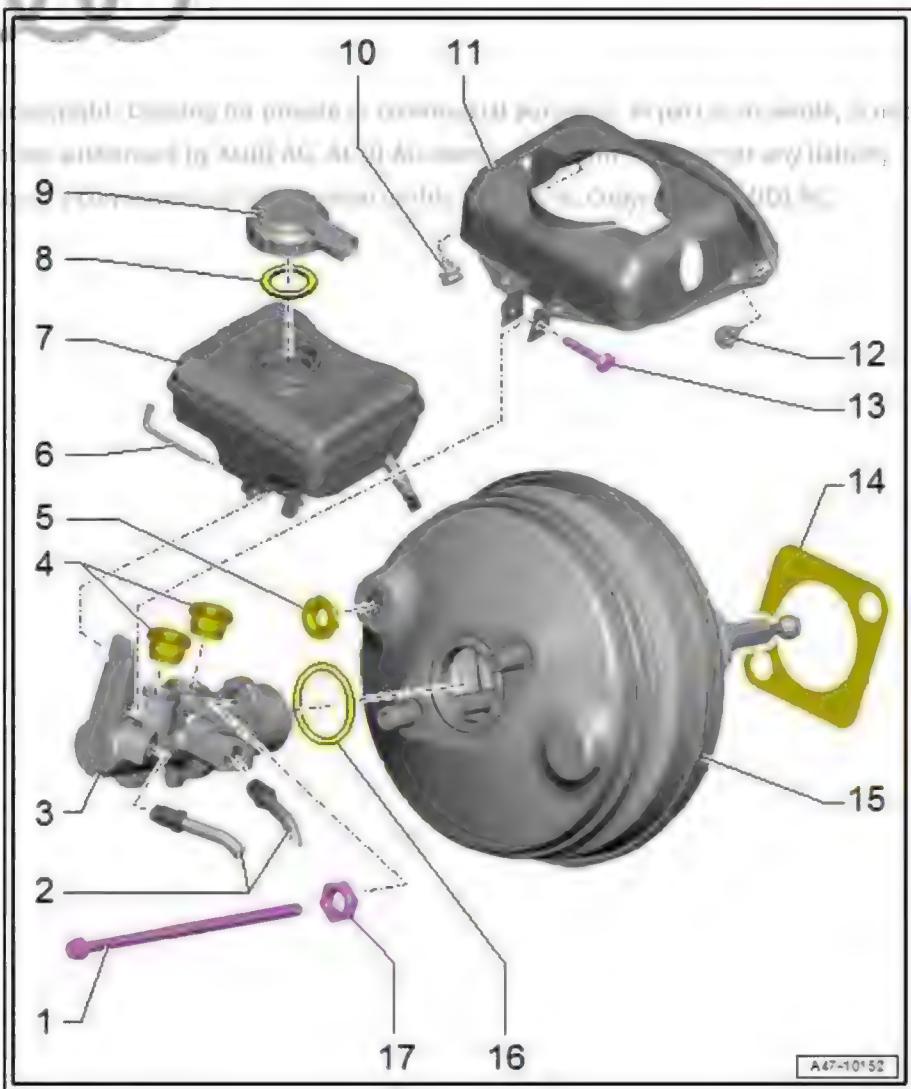
⇒ "3.4 Removing and installing brake fluid reservoir", page 239

#### 3.1 Exploded view - brake servo / brake master cylinder



*The installation position is shown for left-hand drive vehicles; right-hand drive is similar.*

- 1 - Bolt
  - 23 Nm
- 2 - Brake lines
  - 24 Nm
- 3 - Brake master cylinder
  - Cannot be repaired. Renew complete unit if defective
  - Removing and installing  
⇒ page 237
- 4 - Sealing plug
  - Moisten with brake fluid and press into brake fluid reservoir
- 5 - Grommet
  - For vacuum line
  - Insert into brake servo unit
- 6 - Locking pin
  - Slide through brake fluid reservoir and brake master cylinder
  - Locking pin must be pressed into lug on brake fluid reservoir
- 7 - Brake fluid reservoir
  - Removing and installing  
⇒ page 239
- 8 - Seal
- 9 - Filler cap
  - With brake fluid level warning contact - F34-
- 10 - Rubber buffer
- 11 - Guard plate
  - Depending on version



12 - Rubber buffer

13 - Bolt

8 Nm

14 - Gasket

Renew after removing

15 - Brake servo

With bonded gasket

Renew complete unit if defective.

Functional check:

– Firmly depress brake pedal several times with engine switched off (to vent vacuum in servo unit)

– Then hold brake pedal in applied position employing moderate force and start engine. If the servo unit is working properly, the pedal will give slightly under foot (servo assistance becomes activated).

Removing and installing [⇒ page 234](#)

Adjusting ball head [⇒ page 234](#)

16 - Seal

Renew after removing

17 - Nut

Self-locking

Renew after removing

49 Nm

#### Adjusting ball head on brake servo

Dimension a = 164.7 mm ± 0.5 mm

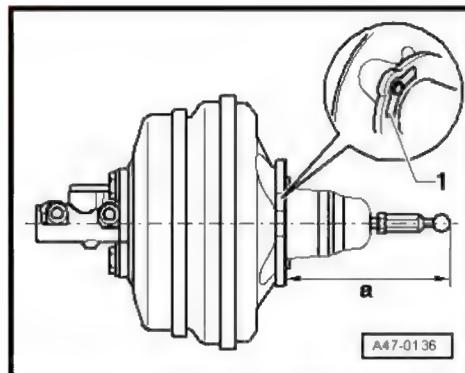


Note

- ◆ Surface -1- for measuring
- ◆ The ball head must be set at right angles to the surface of the brake servo when taking the measurement.
- ◆ Measure to end of ball head without gasket fitted.

#### Tightening torque

Component	Nm
Ball head to brake servo	30



## 3.2 Removing and installing brake servo

### Special tools and workshop equipment required

Financial by assembly. Coverage for provision of commercial passenger car parts in whole or in part by Audi AG to the extent of the value of the parts supplied by Audi AG. Valid for direct purchases of components to Audi AG.  
Audi reserves the right to terminate this agreement at any time by Audi AG.

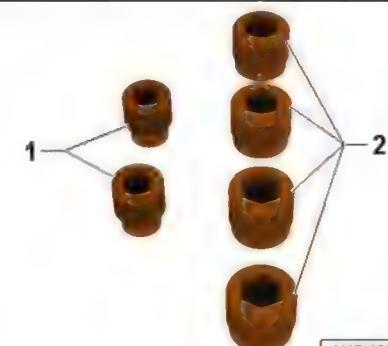
- ◆ Torque wrench - V.A.G 1331-

V.A.G 1331



W00-11166

- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



N45-10322

1 - M10 sealing plugs

2 - M12 sealing plugs

#### Removing

- Switch off engine.
- Press brake pedal repeatedly until there is no more servo assistance.
- The brake pedal will become heavy.
- Separate brake pedal from brake servo [⇒ page 210](#).
- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel
- Remove brake fluid reservoir [⇒ page 239](#).
- Unplug electrical connector -1- on brake servo pressure sensor - G294-.

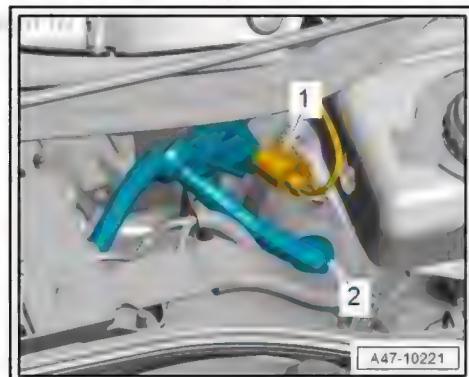


#### Caution

##### *Risk of damage to vacuum hoses*

- ◆ Disconnect vacuum hoses carefully. Damaged vacuum hoses must be renewed.

- Disconnect vacuum hose -2- from brake servo and remove.
- Place sufficient lint-free cloths underneath brake servo.

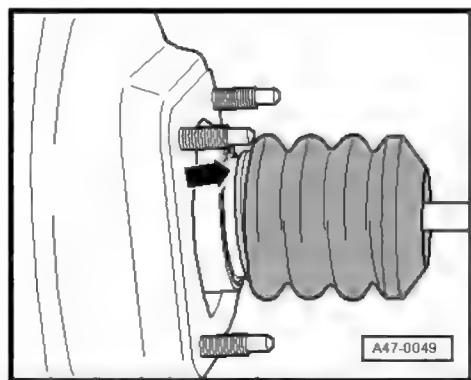
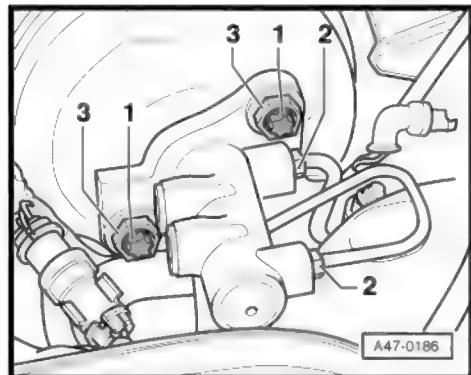


A47-10221

- Disconnect brake lines -2-.
- Seal open lines and connections using sealing plugs from assembly parts set - 5Q0 698 311- .
- Remove bolts -1- for brake servo.
- Take off brake servo with brake master cylinder.

#### Installing

- Before installing brake master cylinder, clean any residual brake fluid off plenum chamber.
- When assembling brake master cylinder with brake servo unit, make sure push rod is properly positioned in brake master cylinder.
- Check that boot has not slipped out of circumferential groove as shown in illustration.
- Carefully insert brake servo in guide and secure with bolts.



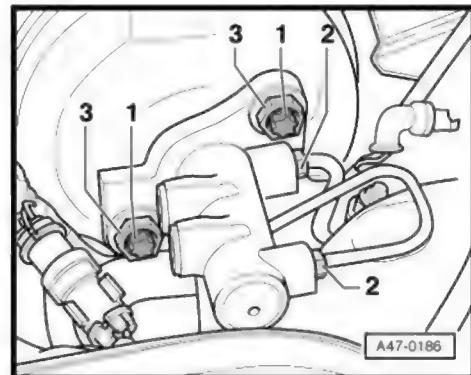
- Tighten bolts -1- for brake servo.
- Insert vacuum hose in brake servo.



**Caution**

*Risk of damage to vacuum hoses*

- ◆ *Damaged vacuum hoses must be renewed.*



- First insert all brake lines -2- in brake master cylinder and screw on lightly.
- Tighten brake lines -2-.
- Install brake fluid reservoir [⇒ page 239](#).
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber partition panel .
- Connect brake pedal to brake servo [⇒ page 211](#).



**Note**

*Make sure that the ball head on the brake servo is installed in the correct position in the mounting on the brake pedal.*

- Bleed brake system [⇒ page 273](#).



**Note**

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*



**WARNING**

*Risk of accident!*

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

#### Tightening torques

- ◆ [⇒ "3.1 Exploded view - brake servo / brake master cylinder", page 233](#)

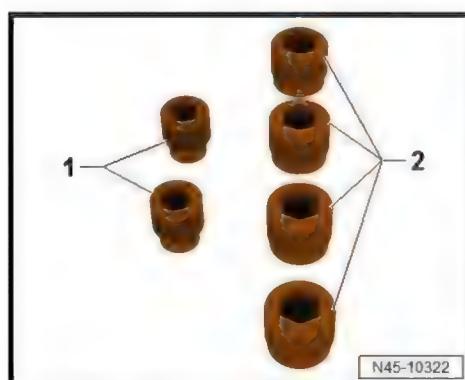
### 3.3 **Removing and installing brake master cylinder**

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



1 - M10 sealing plugs

2 - M12 sealing plugs

Removing



#### **WARNING**

##### **Risk to health**

- ◆ Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.
- ◆ Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.
- ◆ Always observe the relevant environmental regulations for disposal.

##### **Risk of malfunction if brake fluid comes into contact with fluids containing mineral oils.**

- ◆ Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Protective gloves must be free of oil and grease.

##### **Risk of damage to paintwork surfaces**

- ◆ Due to its corrosive effect, brake fluid must not be allowed to come into contact with paintwork. Rinse off brake fluid spillages immediately using plenty of water.

- Remove brake fluid reservoir [⇒ page 239](#).



### Note

Place a cloth under the connection to catch escaping brake fluid.

- Disconnect brake lines -2- and seal with sealing plugs from assembly parts set - 5Q0 698 311- .
- Remove nuts -arrows-.
- Detach brake master cylinder -1- from brake servo and remove.

### Installing

Installation is carried out in reverse order; note the following:



### Note

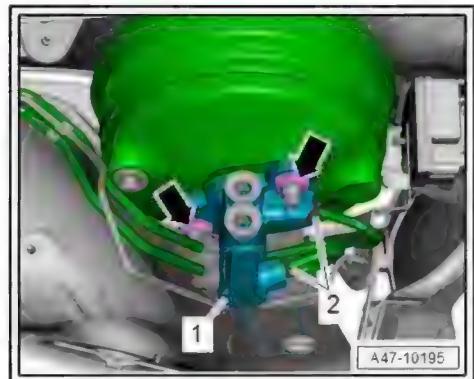
*Renew gasket after removing.*

Reassembly by supervisor. Copying for private purposes of the common parts is prohibited!

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#### Risk of damage to brake servo

- ◆ Brake fluid must not be allowed to enter the brake servo.



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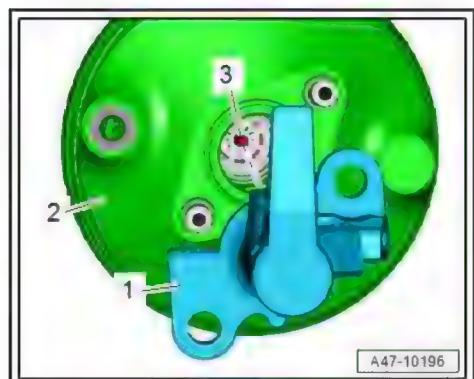
- When fitting brake master cylinder -1-, make sure that push rod -3- is correctly positioned in brake servo -2-.
- If necessary, have a second mechanic depress brake pedal slightly to facilitate insertion of brake master cylinder in push rod.
- Install brake fluid reservoir [page 239](#) .



#### WARNING

##### Risk of accident!

- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



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### Tightening torques

- ◆ [⇒ "3.1 Exploded view - brake servo / brake master cylinder", page 233](#)

## 3.4 Removing and installing brake fluid reservoir

Special tools and workshop equipment required

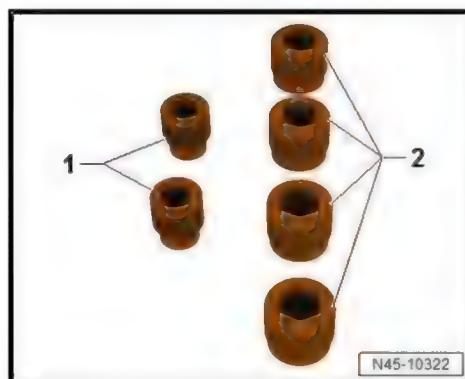
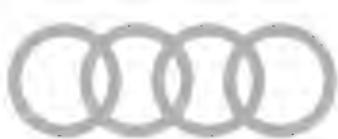
- ◆ Torque wrench - V.A.G 1331-



- ◆ Brake filling and bleeding equipment - VAS 5234-



- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



1 M10 sealing plugs

2 M12 sealing plugs

**Removing**: For the corresponding information to this component, a special Audi A6

- Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .

Vehicles with guard plate:

- Unplug electrical connector -2- from brake fluid level warning contact - F34- .
- Remove bolt -arrow- and detach guard plate -1-.

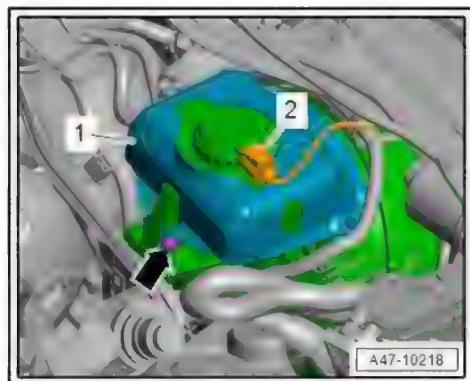
All vehicles (continued):

- Open brake fluid reservoir.

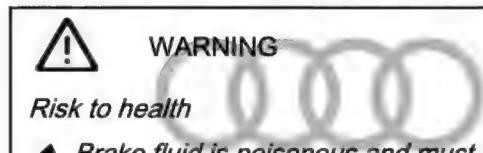


Note

*To protect against escaping brake fluid, place a sufficient number of lint-free cloths in area beneath brake master cylinder.*



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**WARNING**

*Risk to health*

- ◆ *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*
- ◆ *Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.*
- ◆ *Always observe the relevant environmental regulations for disposal.*

*Risk of malfunction if brake fluid comes into contact with fluids containing mineral oils.*

- ◆ *Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Protective gloves must be free of oil and grease.*

*Risk of damage to paintwork surfaces*

- ◆ *Due to its corrosive effect, brake fluid must not be allowed to come into contact with paintwork. Rinse off brake fluid spillages immediately using plenty of water.*

- Draw off as much brake fluid as possible from brake fluid reservoir using brake filling and bleeding equipment - VAS 5234- and adapter - VAS 5234/1A- .

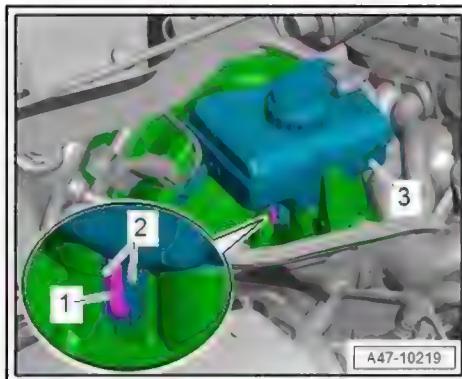


A47-10166

- Pull locking pin -1- for brake fluid reservoir sideways out of reservoir and brake master cylinder.
- Pull off and remove brake fluid reservoir -3-.

 Note

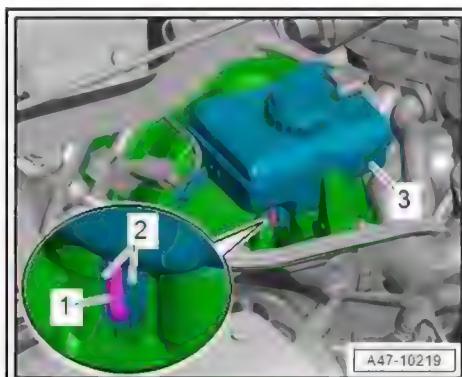
- ◆ *The underside of the brake fluid reservoir clips into the brake master cylinder.*
- ◆ *Disregard -item 2-.*
- Seal open lines and connections using sealing plugs from assembly parts set - 5Q0 698 311- .



Installing

Installation is carried out in reverse order; note the following:

- Lubricate plugs on brake fluid reservoir with brake fluid.
- Insert brake fluid reservoir -3- in sealing plugs in brake master cylinder.
- Slide locking pin -1- through brake fluid reservoir and brake master cylinder so that it engages in retaining lugs -2-.
- Plug in electrical connector at brake fluid level warning contact - F34- .
- If fitted previously, install guard plate.



- Fill up brake fluid to "MIN" mark.
- Bleed brake system [⇒ page 273](#) .

 Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*



**WARNING**

**Risk of accident!**

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

Tightening torques

- ◆ [⇒ "3.1 Exploded view - brake servo / brake master cylinder", page 233](#)
- ◆ Body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links

## 4 Vacuum system

- ⇒ "4.1 Exploded view - electric vacuum pump", page 243
- ⇒ "4.2 Exploded view - vacuum pump", page 244
- ⇒ "4.3 Checking non-return valve", page 248
- ⇒ "4.4 Removing and installing non-return valve", page 249
- ⇒ "4.5 Removing and installing brake servo pressure sensor", page 252
- ⇒ "4.6 Checking vacuum system", page 252
- ⇒ "4.7 Removing and installing electric vacuum pump for brakes", page 256
- ⇒ "4.9 Removing and installing vacuum pump", page 259

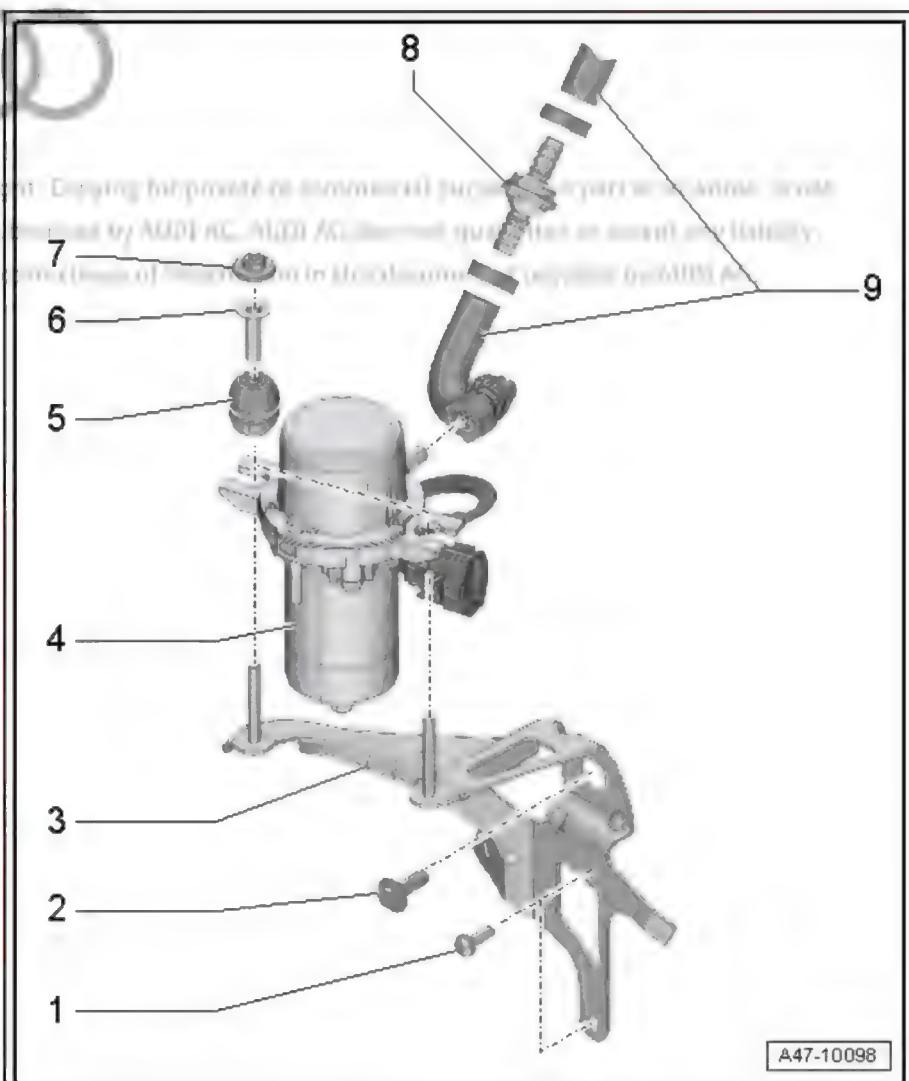
### 4.1 Exploded view - electric vacuum pump



#### Note

The vacuum pump for brakes - V192- is installed in vehicles with a high-voltage system.

- 1 - Bolt
  - 9 Nm
- 2 - Bolt
  - Tightening torque ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - impact bar .
- 3 - Bracket
  - For vacuum pump for brakes - V192-
- 4 - Vacuum pump for brakes - V192-
  - ⇒ "4.7 Removing and installing electric vacuum pump for brakes", page 256
- 5 - Buffer
- 6 - Spacer sleeve
- 7 - Nut
  - 9 Nm
- 8 - Non-return valve
  - ⇒ "4.3 Checking non-return valve", page 248
- 9 - Vacuum hose
  - Connection to brake servo



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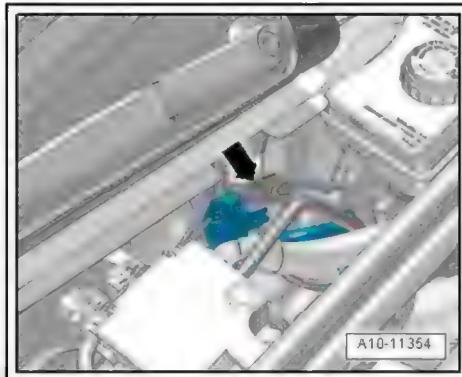
Fitting location of brake servo pressure sensor - G294-

- ◆ In plenum chamber -arrow-

Removing and installing [⇒ page 252](#)



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## 4.2 Exploded view - vacuum pump

⇒ "4.2.1 Exploded view - vacuum pump, vehicles with 2.0 ltr. TFSI engine and high-voltage system", page 244

⇒ "4.2.2 Exploded view - vacuum pump, vehicles with 1.8 ltr./2.0 ltr. TFSI engine", page 246

⇒ "4.2.3 Exploded view - vacuum pump, vehicles with 2.5 ltr./2.8 ltr./3.0 ltr. TFSI engine", page 247

⇒ "4.2.4 Exploded view - vacuum pump, vehicles with 4.0 ltr. TFSI engine", page 248

### 4.2.1 Exploded view - vacuum pump, vehicles with 2.0 ltr. TFSI engine and high-voltage system

**1 - Vacuum pump**

- Removing and installing  
[⇒ page 259](#)

**2 - Gasket**

- Renew after removing

**3 - Vacuum hose**

**4 - Bolt**

- 8 Nm +180°
- Renew after removing

**5 - Vacuum line**

- From activated charcoal filter solenoid valve 1 - N80- to activated charcoal filter

**6 - Bolt**

- 9 Nm

**7 - Bolt**

- 9 Nm

**8 - Bolt**

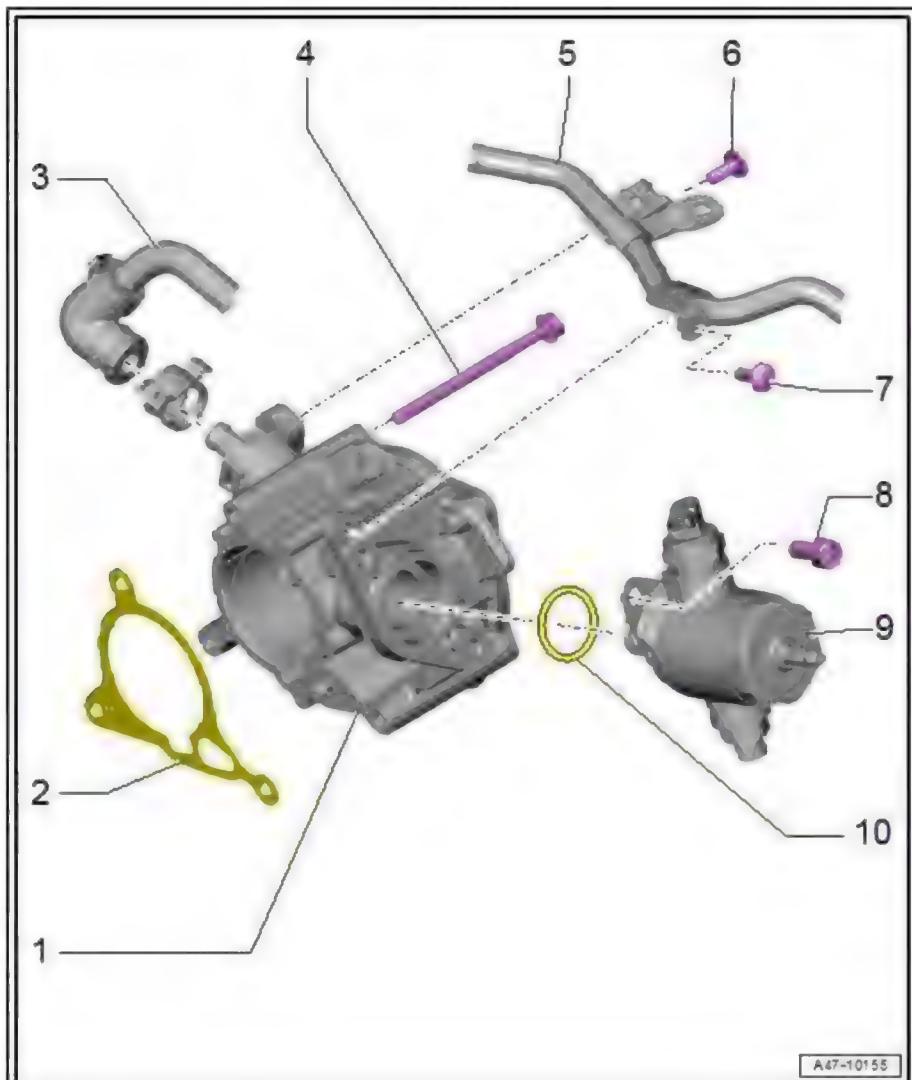
- Tightening torque ⇒ Rep. gr. 24 ; High-pressure pump; Exploded view - high-pressure pump

**9 - High-pressure pump**

- Removing and installing  
[⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump](#)

**10 - O-ring**

- Renew after removing



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#### 4.2.2 Exploded view - vacuum pump, vehicles with 1.8 ltr./2.0 ltr. TFSI engine

1 - Vacuum pump

- Removing and installing  
⇒ [page 259](#)

2 - Gasket

- Renew after removing

3 - Vacuum hose

4 - Bolt

- 8 Nm +180°
- Renew after removing

5 - Vacuum line

- From activated charcoal filter solenoid valve 1 - N80- to activated charcoal filter

6 - Bolt

- 9 Nm

7 - Bolt

- 9 Nm

8 - Bolt

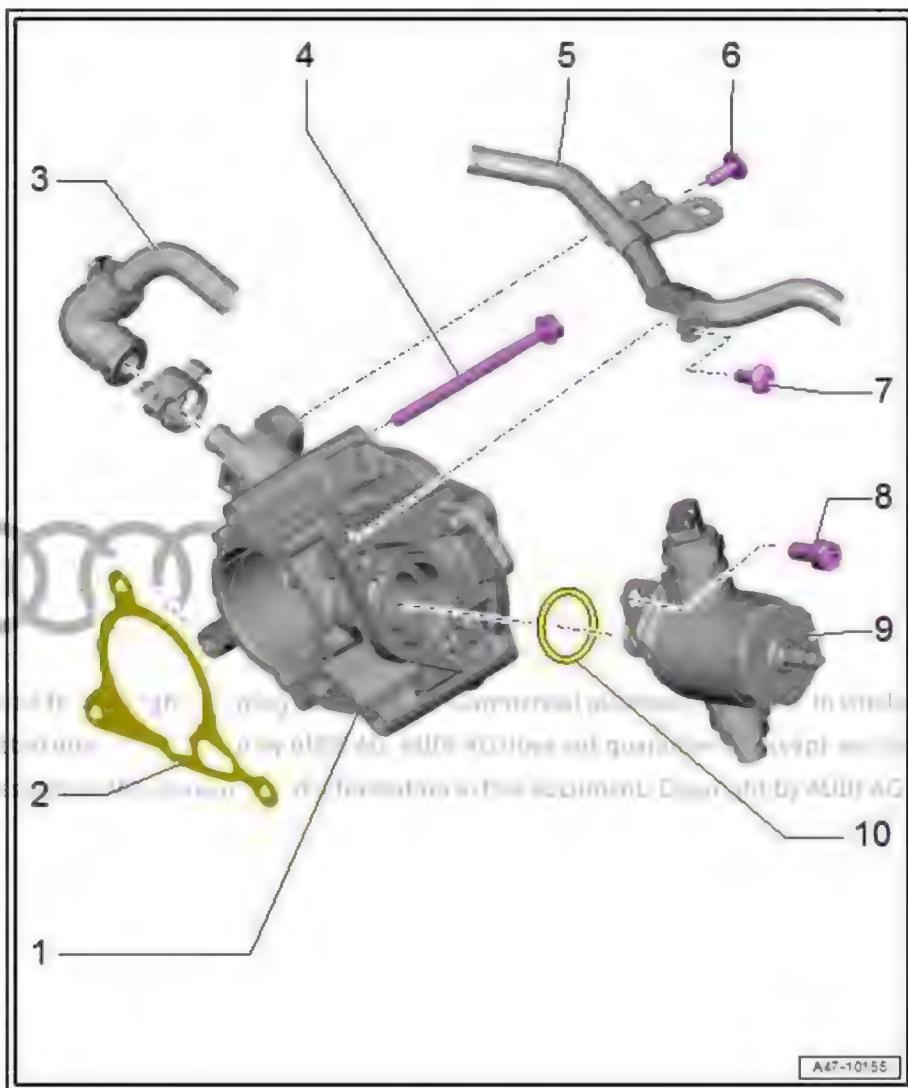
- Tightening torque ⇒ Rep. gr. 24 ; High-pressure pump; Exploded view - high-pressure pump

9 - High-pressure pump

- ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump

10 - O-ring

- Renew after removing



#### 4.2.3 Exploded view - vacuum pump, vehicles with 2.5 ltr./2.8 ltr./3.0 ltr. TFSI engine

1 - Bolt

- 9 Nm

2 - Vacuum pump

- Removing and installing  
[⇒ page 262](#)

3 - Vacuum hose

4 - Vacuum line

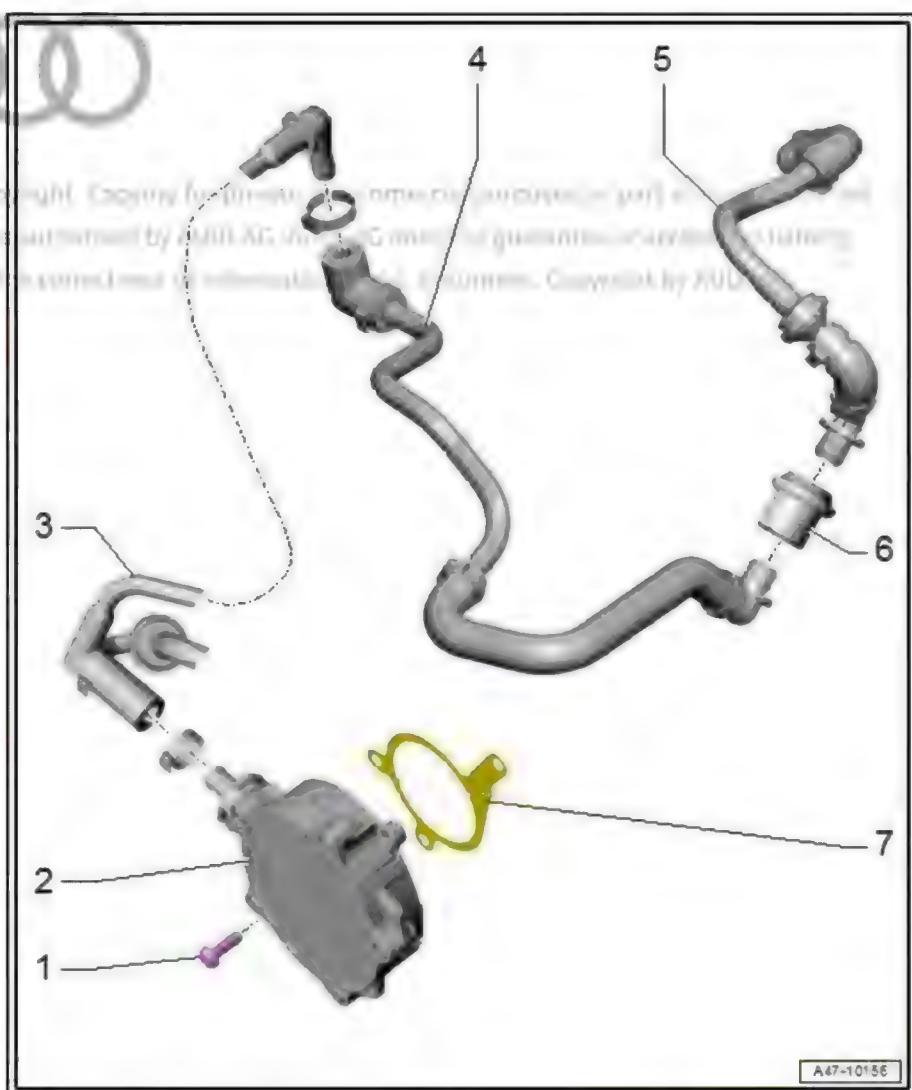
5 - Vacuum line

- With integrated non-return valve
- The non-return valve cannot be renewed separately
- Checking non-return valve [⇒ page 248](#)
- Removing and installing  
[⇒ page 249](#)

6 - Grommet

7 - Gasket

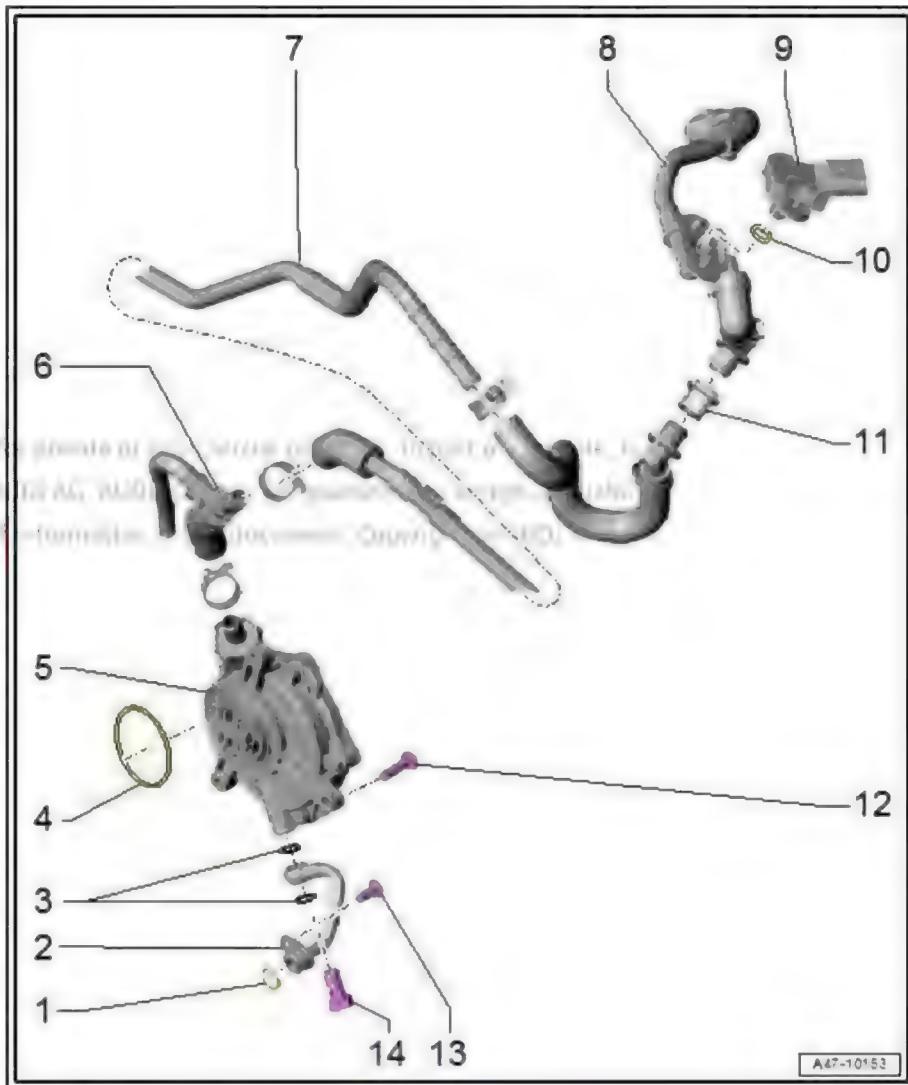
- Renew after removing



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#### 4.2.4 Exploded view - vacuum pump, vehicles with 4.0 ltr. TFSI engine

- 1 - O-ring
  - Renew after removing
- 2 - Oil line
- 3 - Seals
  - Renew after removing
- 4 - O-ring
  - Renew after removing
- 5 - Vacuum pump
  - Removing and installing  
⇒ [page 263](#)
- 6 - Vacuum hose
- 7 - Vacuum line
- 8 - Vacuum line
  - With integrated non-return valve
  - The non-return valve cannot be renewed separately
  - Checking non-return valve ⇒ [page 248](#)
  - Removing and installing  
⇒ [page 249](#)
- 9 - Brake servo pressure sensor - G294-
  - Removing and installing  
⇒ [page 252](#)
- 10 - O-ring
  - Not available individually
  - Renew brake servo pressure sensor - G294- if damaged
- 11 - Grommet
- 12 - Bolt
  - 9 Nm
- 13 - Bolt
  - 9 Nm
- 14 - Banjo bolt
  - 17 Nm



#### 4.3 Checking non-return valve

- Non-return valve removed ⇒ [page 249](#)



Note

The non-return valve is fitted directly in front of the vacuum pump.

- ◆ The valve should allow air to pass in the direction indicated by the arrow.
- ◆ Valve must remain closed in opposite direction.
- Note installation position.
- The arrow indicating the flow direction points towards the vacuum pump.

#### 4.4 Removing and installing non-return valve

⇒ "4.4.1 Removing and installing non-return valve with vacuum hose in plenum chamber", page 249

⇒ "4.4.2 Removing and installing non-return valve with vacuum hose in engine compartment - vehicles with 3.0 ltr. TDI evo engine", page 250

##### 4.4.1 Removing and installing non-return valve with vacuum hose in plenum chamber

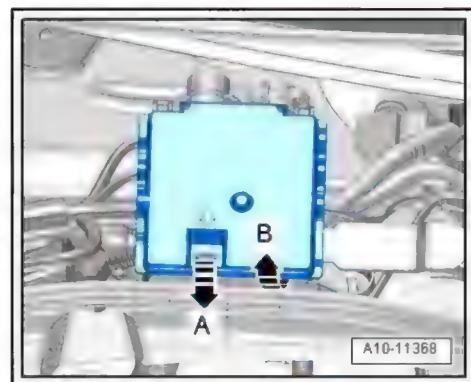


###### Note

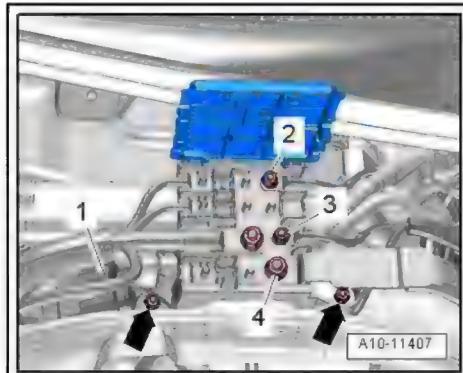
Depending on the engine and model version, the non-return valve with vacuum hose may be fitted with a brake servo pressure sensor - G294- ; for correct version refer to ⇒ Electronic parts catalogue "ETKA".

###### Removing

- Disconnect earth wire from battery terminal ⇒ Electrical system; Rep. gr. 27 ; Disconnecting and connecting battery .
- Remove body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Removing and installing body brace .
- Release catch -arrow A- and open cover -arrow B-.



- Unscrew nuts -2, 3, 4- and move electrical wires clear.
- Detach electrical connector -1- from bracket and unplug.
- Unscrew bolts -arrows-, detach terminal 30 wiring junction 2 - TV22- from plenum chamber partition panel and move to one side.



#### Caution

##### *Risk of damage to vacuum hoses*

- ◆ Disconnect vacuum hoses carefully. Damaged vacuum hoses must be renewed.

- Pull vacuum hose -arrow- off plenum chamber partition panel.



- If fitted, unplug electrical connector -1-.

- Remove non-return valve with vacuum hose -2- (pull it off brake servo).

#### Installing

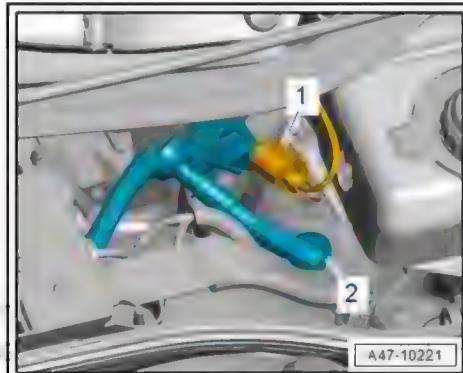
Installation is carried out in reverse order; note the following:



#### Note

*To facilitate installation, moisten the vacuum hose with water, but not with oil.*

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- Installation position: the arrow indicating the flow direction points towards the vacuum pump.
- Observe steps required after re-connecting battery ⇒ Electrical system; Rep. gr. 27 ; Battery; Disconnecting and connecting battery .

#### Tightening torques

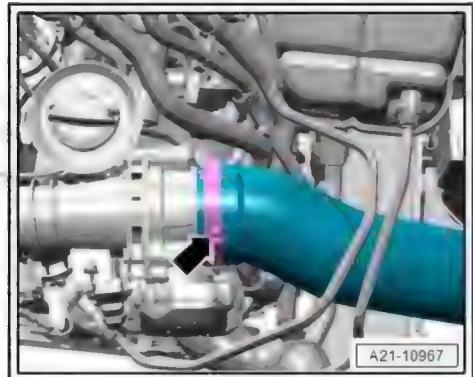
- ◆ Body brace ⇒ Running gear, axles, steering; Rep. gr. 40 ; Suspension strut, upper links; Exploded view - suspension strut, upper links

## 4.4.2 Removing and installing non-return valve with vacuum hose in engine compartment - vehicles with 3.0 ltr. TDI evo engine

#### Removing

- Remove engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

- Remove bracket for air conditioner compressor ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Removing and installing bracket for ancillaries .
- Release hose clip -arrow- and disconnect air hose.



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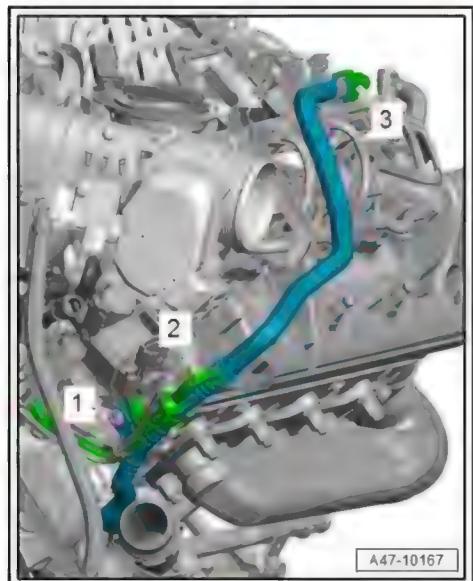


#### Caution

##### *Risk of damage to vacuum hoses*

- ◆ Disconnect vacuum hoses carefully. Damaged vacuum hoses must be renewed.

- Disconnect vacuum hose -2-.
- Remove bolt -1-.
- Press release tabs on both sides and disconnect vacuum hose -3-.



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- Remove bolt -2- and detach vacuum hose -1- with non-return valve.

#### Installing

Installation is carried out in reverse order; note the following:



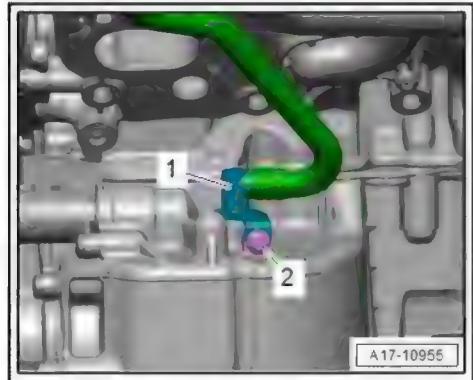
#### Note

- ◆ Renew O-rings.
- ◆ To facilitate installation, moisten the vacuum hose with water, but not with oil.

- Install engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

#### Tightening torques

- ◆ Bracket for air conditioner compressor ⇒ Rep. gr. 13 ; Cylinder block (pulley end); Exploded view - cylinder block (pulley end)
- ◆ ⇒ Rep. gr. 17 ; Sump/oil pump; Exploded view - sump/oil pump
- ◆ ⇒ Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system

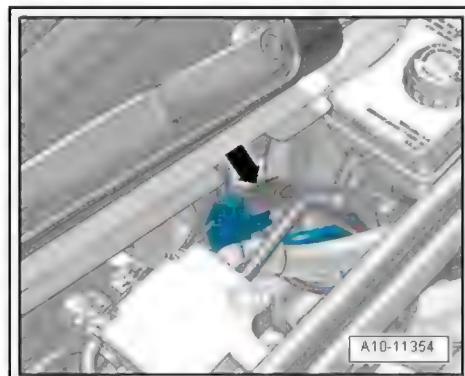


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## 4.5 Removing and installing brake servo pressure sensor

### Removing

- Remove cowl panel trim ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .
- Unplug electrical connector at brake servo pressure sensor - G294- -arrow-.

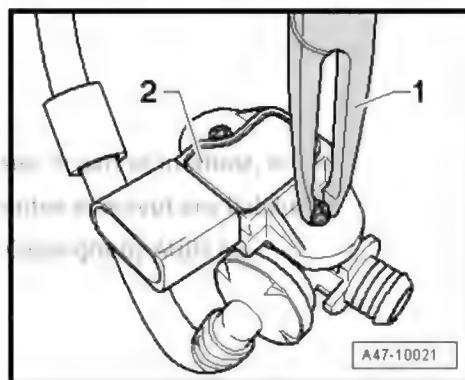


- Release clips using pliers -1-.
- Carefully pry out brake servo pressure sensor - G294- -item 2-.

### Installing

Installation is carried out in reverse order; note the following:

- Install cowl panel trim ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Removing and installing plenum chamber cover .



## 4.6 Checking vacuum system

- ⇒ [“4.6.1 Test and test requirements”, page 252](#)
- ⇒ [“4.6.2 Connecting brake servo tester”, page 253](#)
- ⇒ [“4.6.3 Checking vacuum generation”, page 254](#)
- ⇒ [“4.6.4 Checking for leaks”, page 255](#)
- ⇒ [“4.6.5 Generating vacuum with hand vacuum pump”, page 256](#)

### 4.6.1 Test and test requirements

The following instructions are intended to help you trace the causes of faults quickly and effectively in the event of problems involving the brake servo or in the event of a »hard brake pedal«.

This check relates to the following components:

- ◆ Brake servo
- ◆ Seal between brake master cylinder and brake servo.
- ◆ Non-return valve
- ◆ Vacuum hoses with connectors
- ◆ Vacuum pump (if fitted)

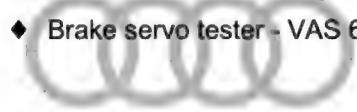
When evaluating the measured results, bear in mind that they will be influenced by your geographical location. The higher your location is above sea level, the lower the air pressure will be.

Before checking the vacuum system, it is important to observe the following test requirements:

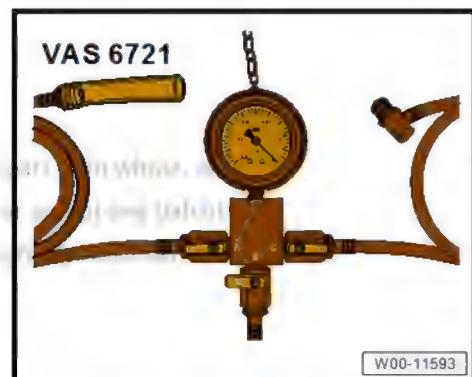
- ◆ Visual inspection of all vacuum hoses for damage (e.g. cracks or animal bites) and to check that they are correctly and firmly attached
- ◆ Ensure cleanliness when working on the vacuum system
- ◆ Before starting work, clean the engine compartment if necessary

Special tools and workshop equipment required

- ◆ Brake servo tester - VAS 6721-



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#### 4.6.2 Connecting brake servo tester

- Pull vacuum hose out of brake servo.

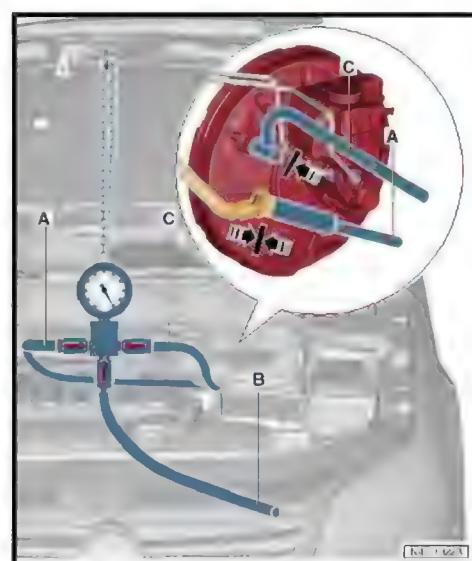


Note

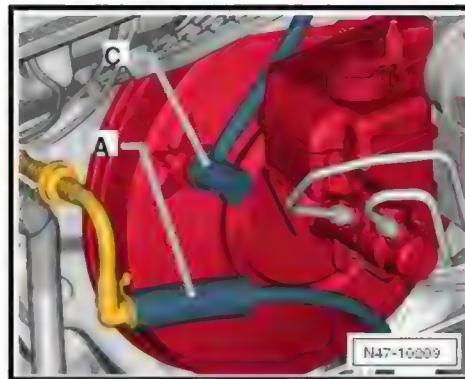
*First press the brake pedal several times in order to facilitate removal of the vacuum hose.*

- Connect brake servo tester - VAS 6721- .

Item	Component	Explanation
A	Shut-off valve	To vacuum hose, non-return valve and (if fitted) vacuum pump
B	Shut-off valve	<ul style="list-style-type: none"> <li>◆ Open to facilitate removal of brake servo tester - VAS 6721-</li> <li>◆ Open to simulate a fault</li> <li>◆ Connection for hand vacuum pump - VAS 6213-</li> </ul>
C	Shut-off valve	To brake servo



- Push hose -A- of brake servo tester - VAS 6721- onto vacuum hose and press adapter -C- into brake servo.



#### 4.6.3 Checking vacuum generation

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- ◆ *The mean atmospheric pressure at sea level is 1013 mbar and decreases rapidly with increasing altitude (approx. 100 mbar per 1,000 m of altitude). Fluctuations at different locations and times also influence vacuum generation.*
- ◆ *A cold engine, an active air-conditioning system as well as engine idling have an adverse influence on vacuum generation.*

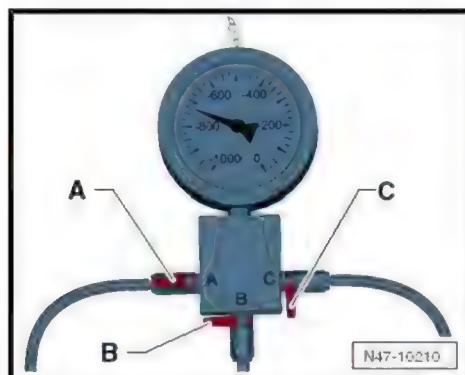
- Before starting work, check all vacuum hoses for damage (e.g. cracks or animal bites) and make sure they are correctly and securely attached.
- Connect brake servo tester - VAS 6721- [⇒ page 253](#).
- Open shut-off valve -A-.
- Close shut-off valves -B and C-.
- Start warm engine (>60° C), press accelerator briefly (engine speed greater than 2000/min).
- Read indicated value.

Under normal conditions (see notes), the generated vacuum should be between 600 and 950 mbar (depending on engine version).

If the specified value is not obtained even though the test conditions (see notes) have been met, the vacuum system must first be checked for leaks.

- For comparison purposes, generate the vacuum with the hand vacuum pump - VAS 6213- [⇒ page 256](#).

Open shut-off valve -B- to facilitate removal of hose connections and adapter.



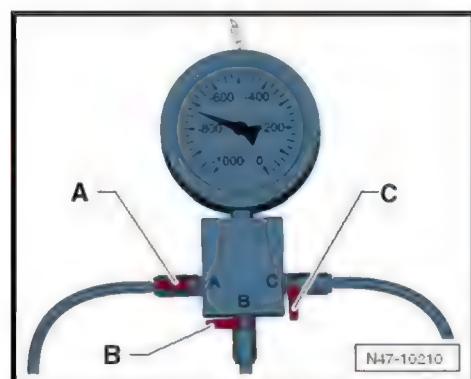
#### 4.6.4 Checking for leaks



##### Note

- ◆ The mean atmospheric pressure at sea level is 1013 mbar and decreases rapidly with increasing altitude (approx. 100 mbar per 1,000 m of altitude). Fluctuations at different locations and times also influence vacuum generation.
- ◆ A cold engine, an active air-conditioning system as well as engine idling have an adverse influence on vacuum generation.
- Before starting work, check all vacuum hoses for damage (e.g. cracks or animal bites) and make sure they are correctly and securely attached.
- Connect brake servo tester - VAS 6721- [⇒ page 253](#).
- Open shut-off valve -A-.
- Close shut-off valves -B and C-.
- Start warm engine (>60° C), press accelerator briefly (engine speed greater than 2000/min).

Under normal conditions (see notes), the generated vacuum should be between 600 and 950 mbar (depending on engine version).

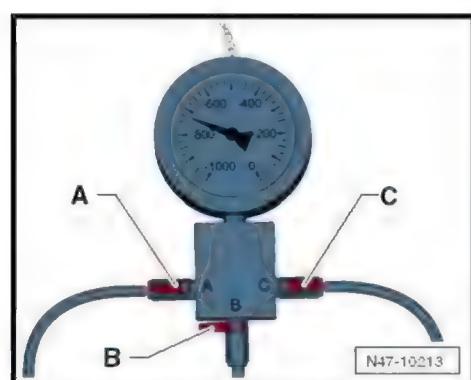


- Open shut-off valve -C- to evacuate brake servo.
- Switch off engine.
- Read and make a note of measured value shown.
- A vacuum decrease of 400 mbar in 12 hours is permissible.



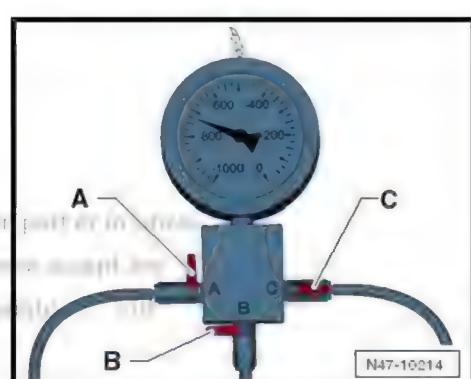
##### Note

If there are major leaks, the vacuum will decrease rapidly within a few seconds.



- If there is a large drop in vacuum, trace the leak as follows:
- A - Vacuum check in vicinity of brake servo
- After building up vacuum, close shut-off valve -A- in order to check brake servo vacuum system.

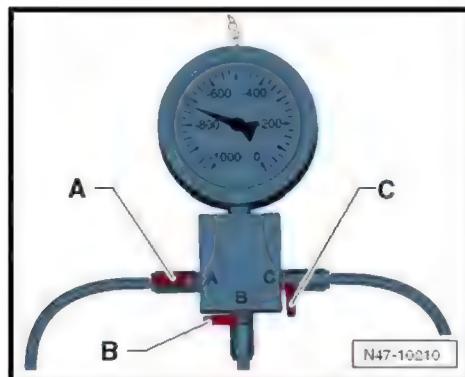
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B - Vacuum check in vicinity of non-return valve, vacuum hoses with connectors and vacuum pump/intake manifold:

- After building up vacuum, close shut-off valve -C- in order to check vacuum system from brake servo tester - VAS 6721- to intake manifold or vacuum pump.

Open shut-off valve -B- to facilitate removal of hose connections and adapter.



#### 4.6.5 Generating vacuum with hand vacuum pump

Special tools and workshop equipment required

- ◆ Hand vacuum pump - VAS 6213-



Instead of vacuum generation using the engine or vacuum pump, vacuum can also be generated by means of the hand vacuum pump - VAS 6213- in certain cases.

- To do this, connect hand vacuum pump - VAS 6213- to vacuum hose from connection -B- on brake servo tester - VAS 6721- .
- Open shut-off valve -B-.
- Generate vacuum with hand vacuum pump - VAS 6213- until brake servo tester - VAS 6721- indicates between 600 and 950 mbar.
- Then carry out the corresponding checks.

#### 4.7 Removing and installing electric vacuum pump for brakes

Torque wrench - V.A.G 1331-

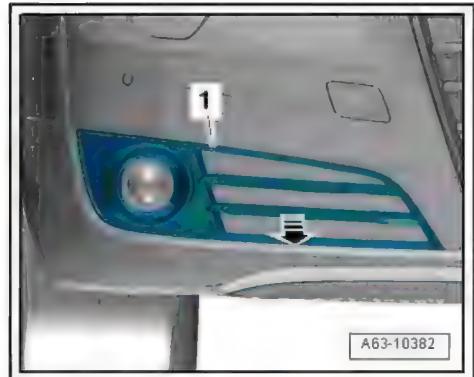


Przedmiotowany do użycia jedynie w celach profesjonalnych i gospodarczych. Nie jest przeznaczony do użycia przez dzieci i nie powinien być dostarczany dzieciom. Używanie bez zgodnego zasadniczością i celami, a także niezgodnie z instrukcją obsługi, może skutkować poważnymi obrażeniami i niebezpiecznymi skutkami dla zdrowia i życia. Wszelkie zmiany i modyfikacje w konstrukcji i funkcjach produktu, dokonane bez pozwolenia producenta, mogą skutkować utratą gwarancji i bezpieczeństwa produktu.



### Removing

- Detach air intake grille -1- (right-side) from bumper cover in direction of -arrow-.



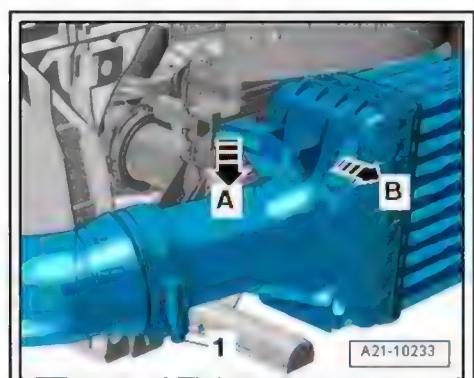
- Release hose clip -1- and disconnect air hose from charge air cooler.



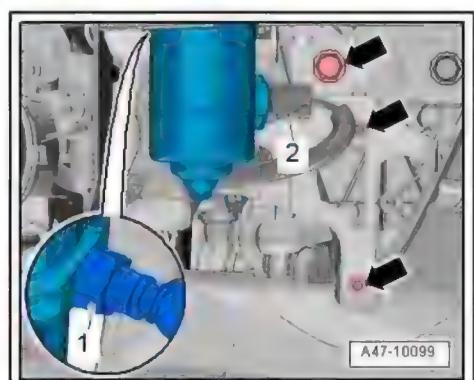
Note

*-Arrows A and B- can be disregarded.*

- Push air hose to one side.



- Remove bolts -arrows-.
- Disconnect electrical connector -2- and vacuum hose -1- and detach vacuum pump for brakes - V192- .



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- Move clear electrical connector -2- at bracket.
- Remove nuts -arrows- and detach vacuum pump for brakes - V192- from bracket.

#### Installing

Installation is carried out in reverse sequence.

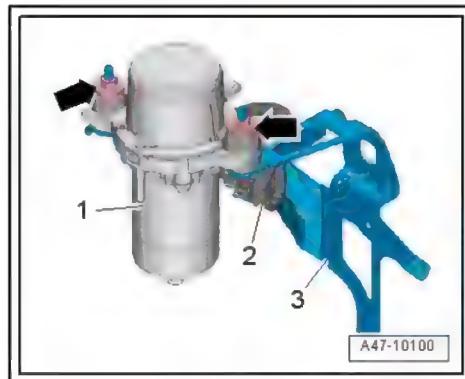
Only applies to A6 e-tron:



Note



*Only applies to A6 e-tron:*



After installing a new electric vacuum pump or re-installing the old electric vacuum pump, a bleeder hose (⇒ Electronic parts catalogue "ETKA") must be fitted to the pump. [⇒ page 258](#)

All vehicles (continued):

#### Tightening torques

- ⇒ ["4.1 Exploded view - electric vacuum pump", page 243](#)
- ⇒ Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - impact bar

## 4.8 Routing bleeder hose

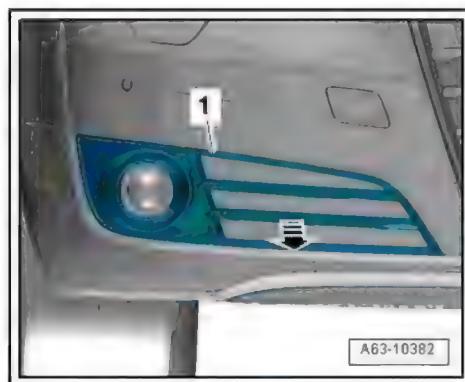
Only applies to A6 e-tron:



Note

*Only applies to A6 e-tron:*

After installing a new electric vacuum pump or re-installing the old electric vacuum pump, a bleeder hose (⇒ Electronic parts catalogue "ETKA") must be fitted to the pump.

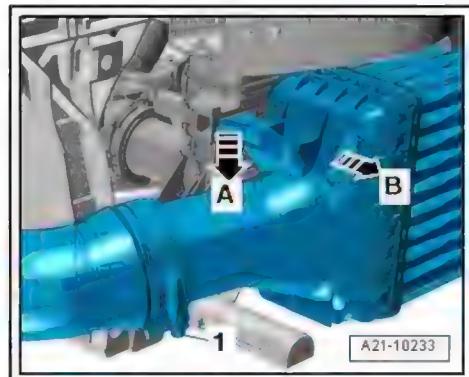


- Air intake grille (right-side) -1- detached from bumper cover in direction of -arrow-
- Air hose detached from charge air cooler (hose clip -1- released)

Only applies to A6 e-tron:

- Moisten bleeder hose (⇒ Electronic parts catalogue "ETKA") to facilitate assembly.

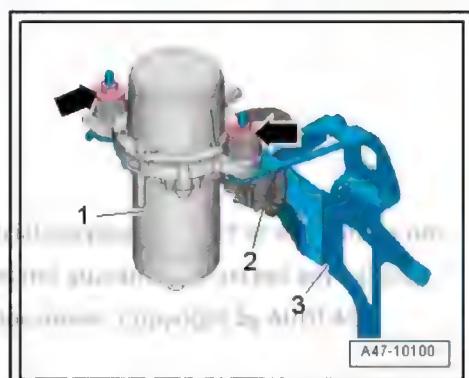
To prevent hose from slipping off, do not use substances that contain oil.



- Slide bleeder hose onto connection -1- of vacuum pump.

Use only genuine bleeder hose ⇒ Electronic parts catalogue "ETKA".

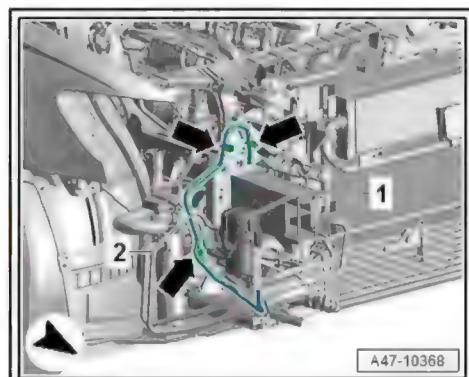
- Slide retaining clips onto bleeder hose.
- Route bleeder hose -2-.



- Secure bleeder hose to vehicle with clips -arrows-.

Tightening torques

- ⇒ "4.1 Exploded view - electric vacuum pump", page 243
- ⇒ Rep. gr. 21 ; Charge air system; Exploded view - hose connections for charge air system
- ⇒ General body repairs, exterior; Rep. gr. 63 ; Bumper (front); Exploded view - impact bar



## 4.9 Removing and installing vacuum pump

⇒ "4.9.1 Removing and installing vacuum pump - vehicles with 2.0 ltr. TFSI engine and high-voltage system", page 259

⇒ "4.9.2 Removing and installing vacuum pump - vehicles with 1.8 ltr./2.0 ltr. TFSI engine", page 261

⇒ "4.9.3 Removing and installing vacuum pump - vehicles with 2.5 ltr./2.8 ltr./3.0 ltr. TFSI engine", page 262

⇒ "4.9.4 Removing and installing vacuum pump - vehicles with 4.0 ltr. TFSI engine", page 263

⇒ "4.9.5 Removing and installing vacuum pump - vehicles with 3.0 ltr. TDI engine", page 265

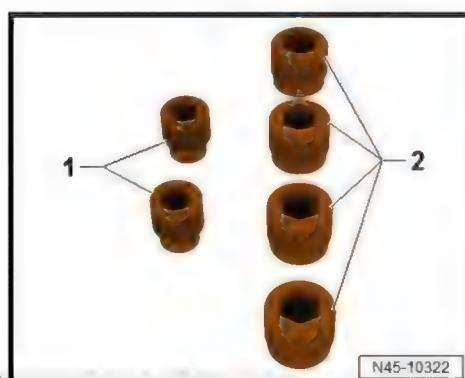
### 4.9.1 Removing and installing vacuum pump - vehicles with 2.0 ltr. TFSI engine and high-voltage system

Special tools and workshop equipment required

- ◆ Torque wrench - V.A.G 1331-



- ◆ Sealing plugs from assembly parts set - 5Q0 698 311-



### Removing

- Remove plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel .
- Remove high-pressure pump ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .
- Remove bolts -arrows- and push coolant line -1- slightly to one side.



- Release hose clip -1- and disconnect vacuum hose.



**Caution**

*Take care not to damage vacuum hoses. Damaged vacuum hoses must be renewed.*

- Remove bolts -arrows- from sealing flange of vacuum pump.
- Pull vacuum pump out of its mounting and detach.

**Installing**

Installation is carried out in reverse order; note the following:



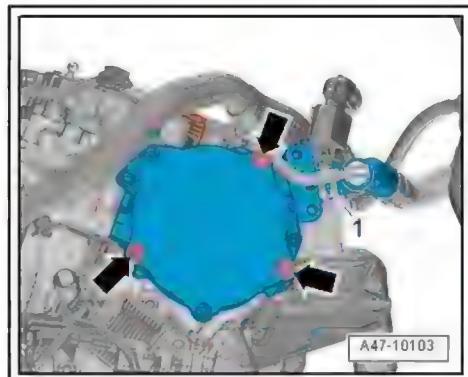
**Note**

*Renew gasket.*

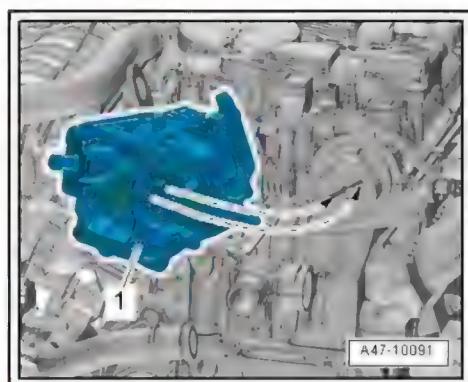
- Ensure that gasket is seated correctly.
- Turn drive lugs of vacuum pump -1- so they engage in slot in camshaft when vacuum pump is installed -arrows-.
- Install high-pressure pump ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .
- Install plenum chamber partition panel ⇒ General body repairs, exterior; Rep. gr. 50 ; Bulkhead; Exploded view - plenum chamber partition panel .

**Tightening torques**

- ◆ ⇒ “4.2.1 Exploded view - vacuum pump, vehicles with 2.0 ltr. TFSI engine and high-voltage system”, page 244



A47-10103



A47-10091

## 4.9.2 Removing and installing vacuum pump - vehicles with 1.8 ltr./2.0 ltr. TFSI engine

Special tools and workshop equipment required

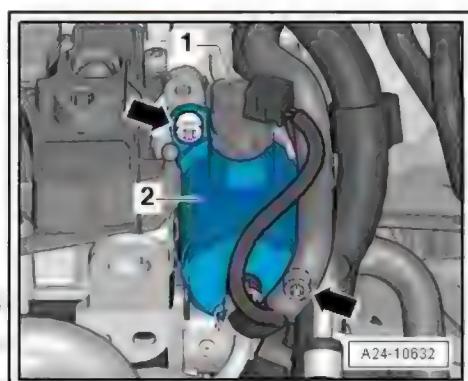
- ◆ Torque wrench - V.A.G 1331-

**Removing**

- Remove high-pressure pump -2- ⇒ Rep. gr. 24 ; High-pressure pump; Removing and installing high-pressure pump .



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A24-10632

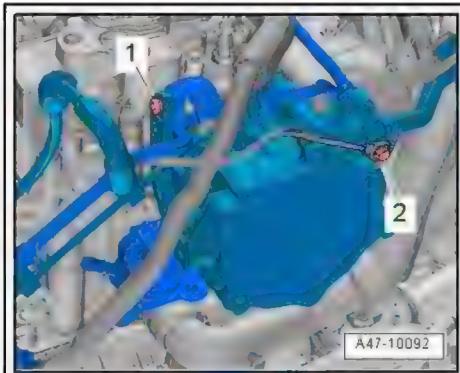
- Remove bolt -1- for coolant line and bolt -2- for earth wire.



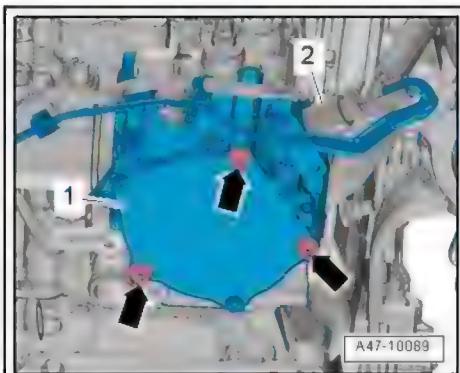
Caution

*Risk of damage to vacuum hoses*

- ◆ *Disconnect vacuum hoses carefully. Damaged vacuum hoses must be renewed.*



- Disconnect vacuum hoses -2- from vacuum pump -1- and move clear.
- Remove bolts -arrows- from sealing flange of vacuum pump.



- Pull vacuum pump out of its mounting and detach.

**Installing**

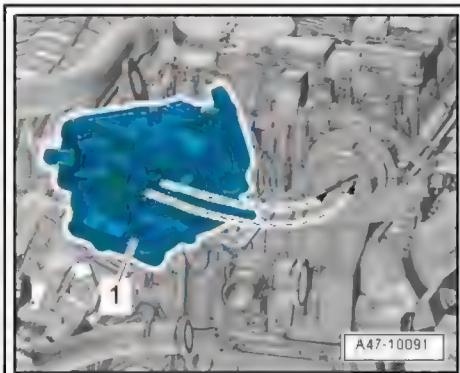
Installation is carried out in reverse order; note the following:



Note

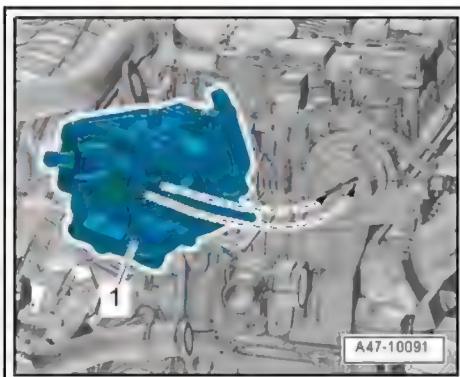
*Renew gasket after removing.*

- Ensure that gasket is seated correctly.
- Turn drive lugs of vacuum pump -1- so they engage in slot in camshaft when vacuum pump is installed -arrows-.



**Tightening torques**

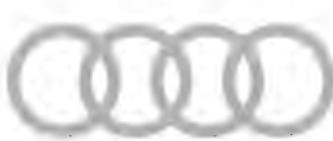
- ◆
- ◆ ⇒ Rep. gr. 24 ; High-pressure pump; Exploded view - high-pressure pump



#### 4.9.3 Removing and installing vacuum pump - vehicles with 2.5 ltr./2.8 ltr./3.0 ltr. TFSI engine

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◆ Torque wrench - V.A.G 1331-



V.A.G 1331



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W00-11166

**Removing**

- Remove engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .
- Release hose clip -1- and disconnect vacuum hose.
- Remove bolts -arrows- and detach vacuum pump.

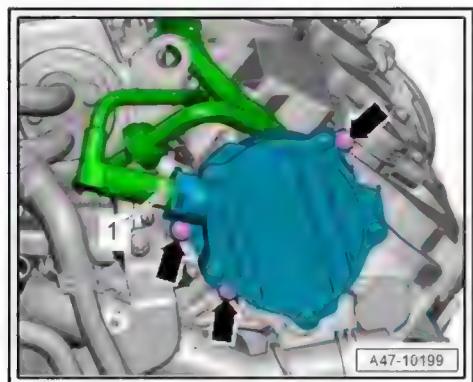
**Installing**

Installation is carried out in reverse order; note the following:



**Note**

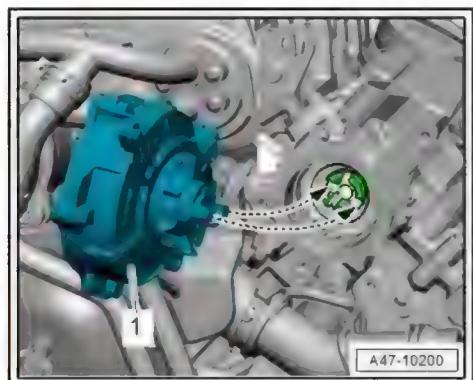
- ◆ *Renew gasket after removing.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue "ETKA".*



- Set drive lugs of vacuum pump -1- so they engage in symmetrical slot in camshaft when vacuum pump is installed -arrows-.
- Install engine cover panel ⇒ Rep. gr. 10 ; Engine cover panel; Removing and installing engine cover panel .

**Tightening torques**

- ◆ ⇒ ["4.2.3 Exploded view - vacuum pump, vehicles with 2.5 ltr./2.8 ltr./3.0 ltr. TFSI engine", page 247](#)



#### 4.9.4 Removing and installing vacuum pump - vehicles with 4.0 ltr. TFSI engine

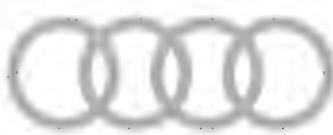
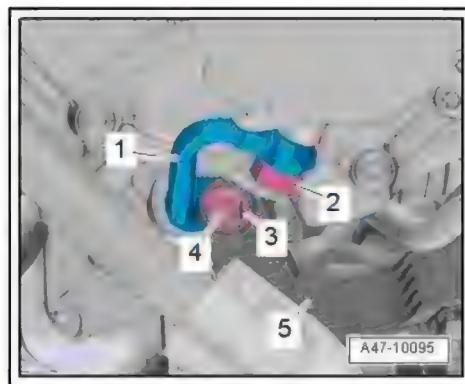
Special tools and workshop equipment required

◆ Torque wrench - V.A.G 1331-



**Removing**

- Remove catalytic converter for cylinder bank 2 (left-side) ⇒ Rep. gr. 26 ; Emission control system; Removing and installing catalytic converter .
- Unscrew nut -3-.
- Detach bracket -5- from bolt -4- and push bracket slightly to one side.
- Unscrew bolt -4- and banjo bolt -2-.
- Detach oil line -1-.



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**Caution**

**Risk of damage to vacuum hoses**

- ◆ *Disconnect vacuum hoses carefully. Damaged vacuum hoses must be renewed.*

- Release hose clip -1- and disconnect vacuum hose.
- Remove bolts -arrows-, pull vacuum pump out of cylinder head and remove.

**Installing**

Installation is carried out in reverse order; note the following:



**Note**

- ◆ *Renew seals and O-rings after removing.*
- ◆ *Secure all hose connections with the correct type of hose clips (same as original equipment) ⇒ Electronic parts catalogue "ETKA".*
- Set drive lugs of vacuum pump so they engage with slots in camshaft when vacuum pump is installed.
- Fit vacuum pump and tighten bolts.

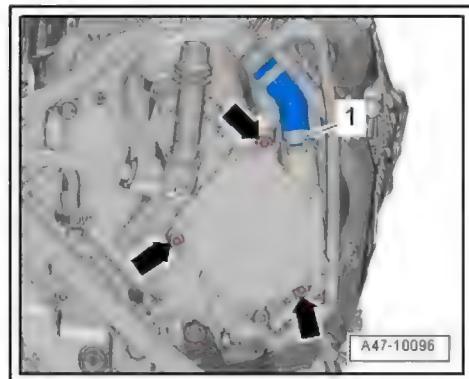
**Tightening torques**

- ◆ ⇒ ["4.2.4 Exploded view - vacuum pump, vehicles with 4.0 ltr. TFSI engine", page 248](#)
- ◆ ⇒ Rep. gr. 26 ; Exhaust pipes/silencers; Exploded view - silencers

#### 4.9.5 Removing and installing vacuum pump - vehicles with 3.0 ltr. TDI engine

The vacuum pump and oil pump are combined as a single unit.

Removing and installing ⇒ Rep. gr. 17 ; Sump/oil pump; Removing and installing oil pump .



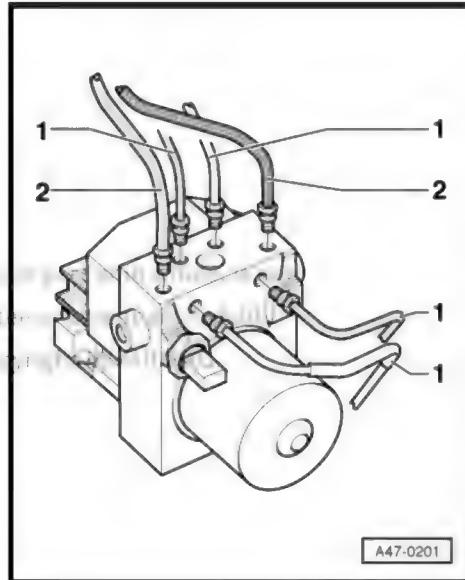
## 5 Brake lines

- ⇒ “5.1 Connection points”, page 266
- ⇒ “5.2 Routing of brake lines”, page 266
- ⇒ “5.3 Repairing brake lines”, page 266

### 5.1 Connection points

Lines to hydraulic unit

Component	Nm
Brake lines from hydraulic unit to brake calipers	14
Brake lines from hydraulic unit to brake master cylinder	16



### 5.2 Routing of brake lines

- ◆ The brake lines and brake pipes are supplied as replacement parts ready for installation.
- ◆ Secure brake hoses and brake lines to the original mounting points when installing.



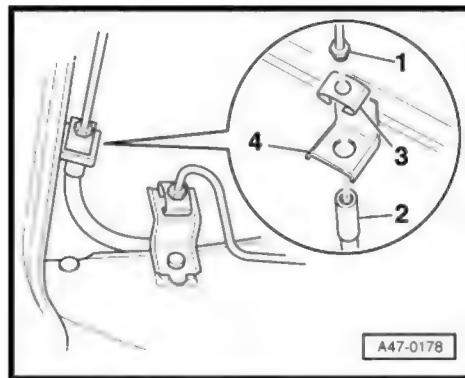
#### WARNING

*Risk of accident!*

- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.

Routing of brake lines

- 1 - Brake line
- 2 - Brake hose
- 3 - Retaining spring
- 4 - Brake hose retainer



### 5.3 Repairing brake lines

With the aid of the flanging tool for brake lines - VAS 6056- it is possible to make connections on the ends of the brake lines with-

out damaging the coating. In certain cases this makes it possible to replace sections of brake lines and thus save repair costs.



**Caution**

**Risk of damage to brake lines**

- ◆ *The flaring tool set V.A.G 1356 must not be used for the black brake lines because of the coating and the diameter of these brake lines.*
- ◆ *Do not bend brake lines more than 90°; this would cause kinks or other deformations which would excessively restrict the brake lines.*



**Note**

- ◆ *Wherever possible, disconnect the brake lines on the underside of the vehicle.*
- ◆ *Select the position of the connecting pieces so that they cannot chafe against any moving parts.*
- ◆ *Do not grease the spindle; clean with methylated spirits or commercially available brake cleaner only.*

**Special tools and workshop equipment required**

- ◆ Flanging tool for brake lines - VAS 6056-



W00-11594

**List of individual tools**

1 - Flanging tool -VAS 6056/1-  
(including jaws -VAS 6056/6- )

2 - Pipe cutter -VAS 6056/2-

3 - Brake line scraper tool -VAS  
6056/3-

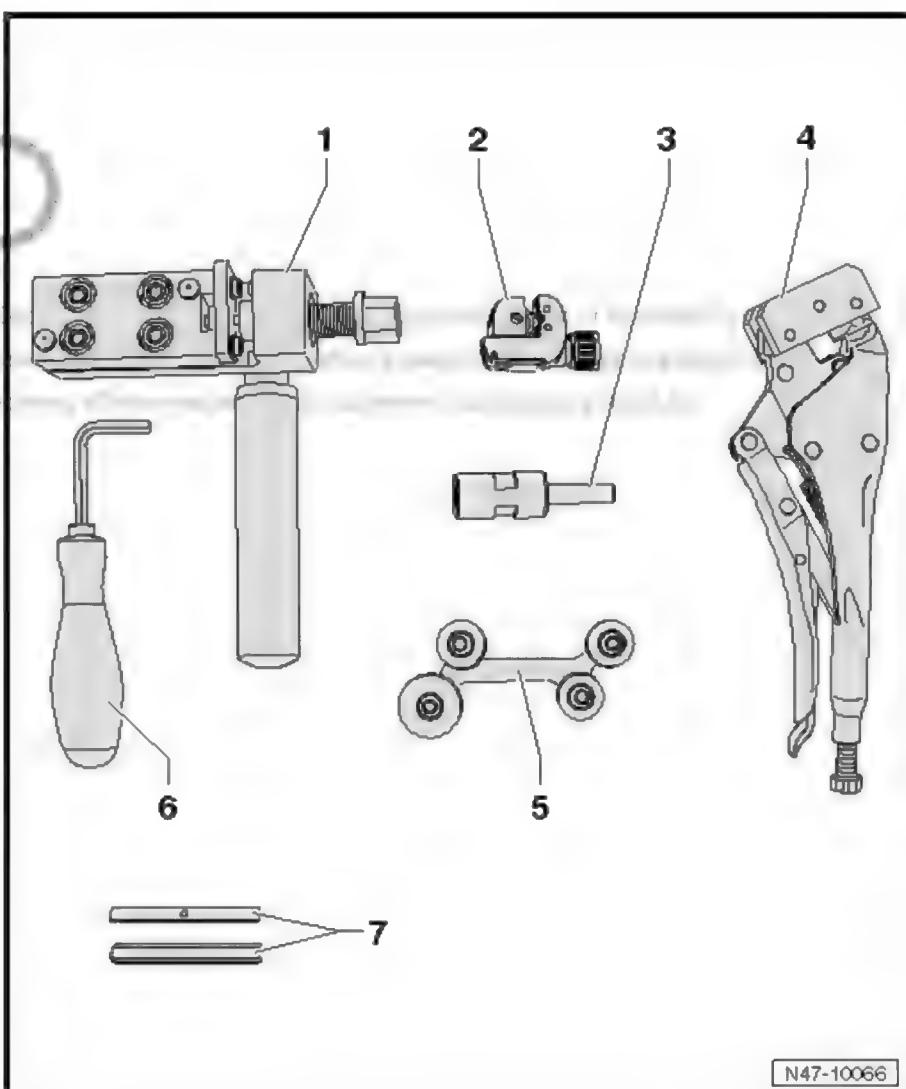
The grub screws (in the  
stem and on the sides of  
the tool) are pre-set and  
must not be turned.

4 - Set of grips with plastic jaws  
-VAS 6056/4-

5 - Pipe bending tool -VAS  
6056/5-

6 - Allen key (6 mm)

7 - Jaws for flanging tool -VAS  
6056/6- , -VAS 6056/7-



N47-10066

Flanging tool (including jaws VAS 6056/6)

**1 - Top section of flanging tool**

- Unscrew this part to change jaws of flanging tool

**2 - Mounting for handle**

- Must be removed to access retaining screw for top section

**3 - Retaining screw**

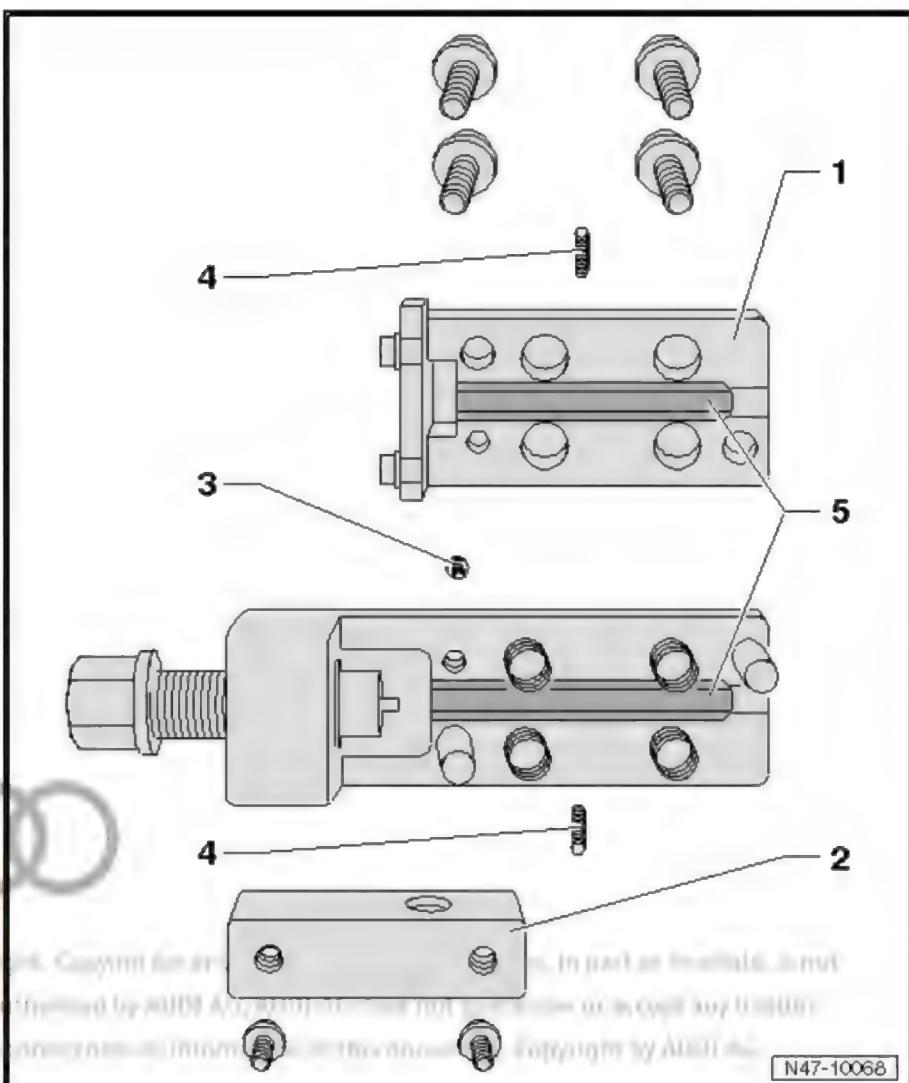
- For top section of flanging tool

**4 - Grub screws for jaws**

- These screws centralise and secure jaws of flanging tool
- 2 mm socket head

**5 - Jaws for flanging tool**

- Different versions available
- Assembly instructions [⇒ page 269](#)



**Assembly instructions for jaws of flanging tool:**

- ◆ VAS 6056/6 (dark) for black brake lines
- ◆ VAS 6056/7 (light) for green brake lines

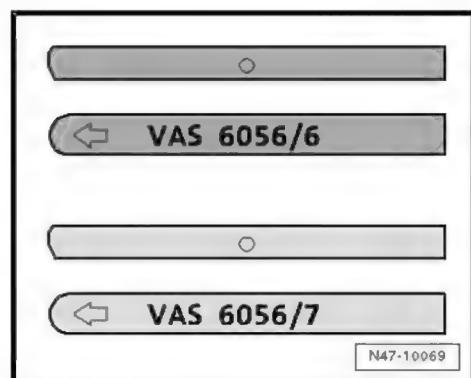


Note

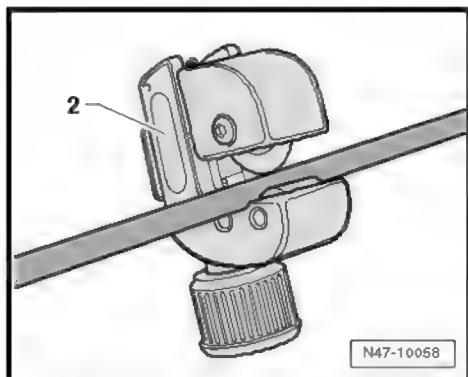
*The arrow on the rounded end of the jaws must face the end of the housing and the straight end of the jaws must face the spindle, otherwise the flanged connection on the brake line will not be formed correctly.*

**Instructions for use**

- Unscrew defective brake line at brake caliper or wheel brake cylinder. Catch escaping brake fluid and dispose of fluid in the correct manner.



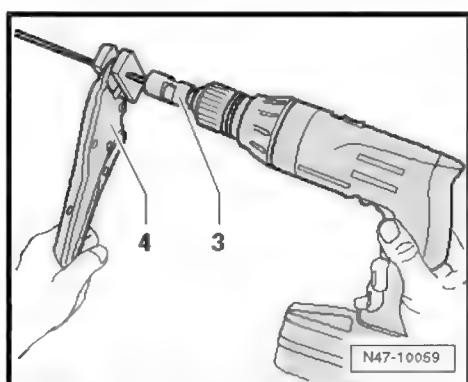
- Cut through brake line at a suitable point (straight, easily accessible section of pipe) using pipe cutter -2-.
- Remove section of pipe to be replaced.
- De-grease outside surface of brake lines.



- Clamp brake line in mole grips -4- so that approx. 50mm protrudes out of plastic jaws.
- Clamp brake line scraper tool -3- in electric drill and apply tool to brake line.
- With electric drill running at slow speed, exert light pressure and strip off coating from brake line.

The length of the coating that is stripped off is determined by the limit stop incorporated in the brake line scraper tool.

- Pull scraper tool off brake line and clean off residue of coating.
- Remove mole grips and slide union screw -D- onto brake line.

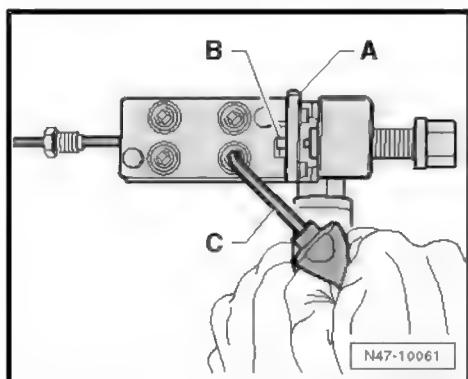
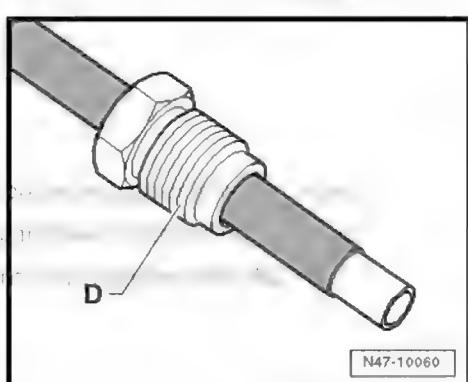


- Push brake line -B- against limit stop -A- in flanging tool.

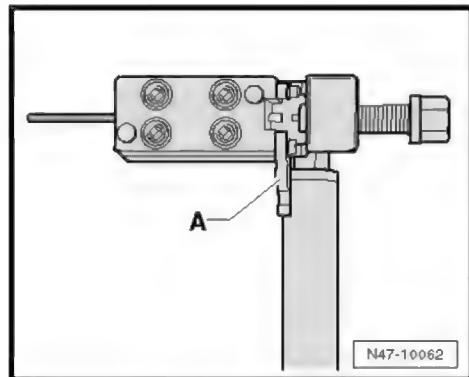


*The brake line must be in contact with the limit stop when the socket head bolts are tightened, otherwise the flanged connection on the brake line will not be formed correctly.*

C - Allen key

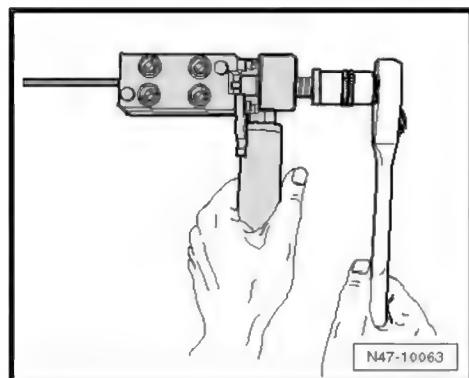


- Clamp brake line in flanging tool until brake line can no longer be moved. Then fold up limit stop -A- and fully tighten socket head bolts in diagonal sequence using Allen key.



N47-10062

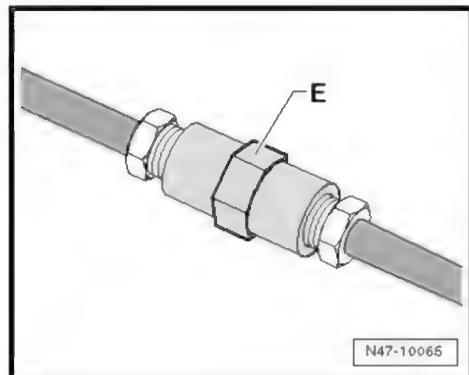
- Screw spindle into flanging tool onto limit stop.
- Unscrew spindle.
- Slacken off socket head bolts in diagonal sequence.
- Take brake line out of flanging tool. Clean and inspect brake line with flanged connection.
- Connect brake filling and bleeding equipment - VAS 5234- and briefly flush out section of pipe remaining in vehicle.
- Attach hose of reservoir to flanged connection of brake line and operate brake filling and bleeding equipment - VAS 5234- briefly until some brake fluid has run through.
- Blow out new section of brake line with compressed air before installing.
- Join together sections of brake line with connecting piece -E-.
- Install brake line.
- Finally, bleed brake system [⇒ page 273](#).



N47-10063

Note

- ◆ Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.
- ◆ Bleeder screw: 10 Nm



N47-10065

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## 6 Hydraulic system

⇒ “6.1 General notes on brake fluid”, page 272

⇒ “6.2 Bleeding hydraulic system”, page 273

⇒ “6.3 Leak test”, page 280

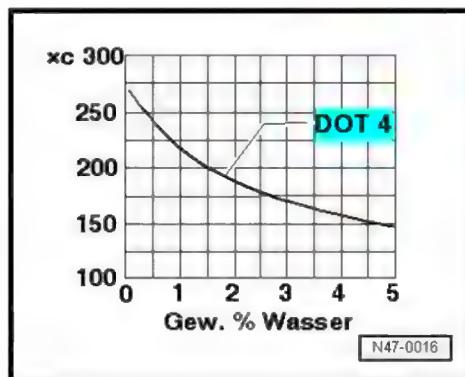
### 6.1 General notes on brake fluid

Brake fluid is hygroscopic, i.e. it has the tendency to absorb water and moisture from the atmosphere.

The boiling point decreases as the water content increases, which means a considerable rise in brake fluid temperature can lead to formation of vapour bubbles and brake failure.

The colour of the brake fluid becomes darker over the course of time. A dark brake fluid colour is not an indication of its condition. The change in colour is caused by chemical reactions.

Even minute quantities coming into contact with a seal or sleeve will affect the component and could impair brake operation. The consequences of a contaminated brake system only become apparent months later, and then give rise to greater expenses, particularly in vehicles equipped with ABS.

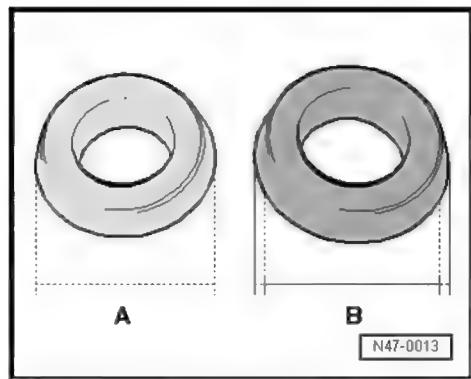


A = Sleeve (original size)

B = Sleeve (swollen due to contact with mineral oil)

Summary of the above mentioned points:

- ◆ Always keep brake fluid containers properly sealed. This is the only way of preventing contamination by oil, dirt, cleaning agents or moisture.
- ◆ Brake fluid containers should be kept completely separate from oils (including hydraulic fluid) and cleaning agents to prevent any mixture of fluids or even filling of the brake system with an incorrect fluid.



### WARNING

#### *Risk to health*

- ◆ *Brake fluid is poisonous and must NOT be drawn off by sucking through a hose.*
- ◆ *Always wear chemical-resistant protective gloves to prevent brake fluid from contacting skin.*
- ◆ *Always observe the relevant environmental regulations for disposal.*

*Accident risk: if the water content in the brake fluid is too high, this can cause vapour bubbles in the fluid.*

- ◆ *Brake fluid is hygroscopic, i.e. it absorbs moisture from the surrounding air.*
- ◆ *Seal open brake hoses and brake lines using sealing plugs from assembly parts set - 5Q0 698 311-.*
- ◆ *Always keep brake fluid in sealed airtight containers.*

*Risk of malfunction if brake fluid comes into contact with fluids containing mineral oils.*

- ◆ *Brake fluid must NOT come into contact with fluids containing mineral oils (oil, petrol, cleaning agents). Protective gloves must be free of oil and grease.*

#### *Risk of damage to paintwork surfaces*

- ◆ *Due to its corrosive effect, brake fluid must not be allowed to come into contact with paintwork. Rinse off brake fluid spillages immediately using plenty of water.*



#### Note

- ◆ *Always use fresh brake fluid.*
- ◆ *Rinse off brake fluid spillages using plenty of water.*

## 6.2 Bleeding hydraulic system



#### Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*

⇒ “6.2.1 Bleeding hydraulic system with brake filling and bleeding equipment”, page 274

⇒ “6.2.2 Bleeding brake system without brake filling and bleeding equipment”, page 277

## 6.2.1 Bleeding hydraulic system with brake filling and bleeding equipment



Note

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◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*

◆ *Bleeder screw: 10 Nm*

Special tools and workshop equipment required

◆ Brake filling and bleeding equipment - VAS 5234- with adapter  
- VAS 5234/1A-



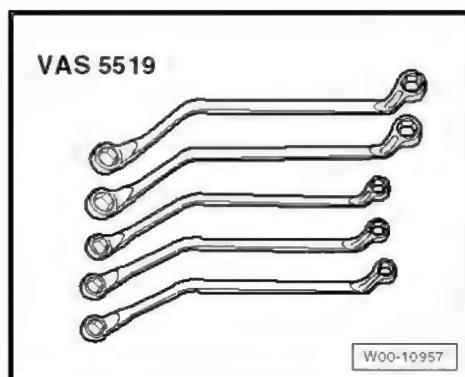
◆ Or

◆ Brake filling and bleeding equipment - VAS 6860- with adapter  
- VAS 5234/1A-

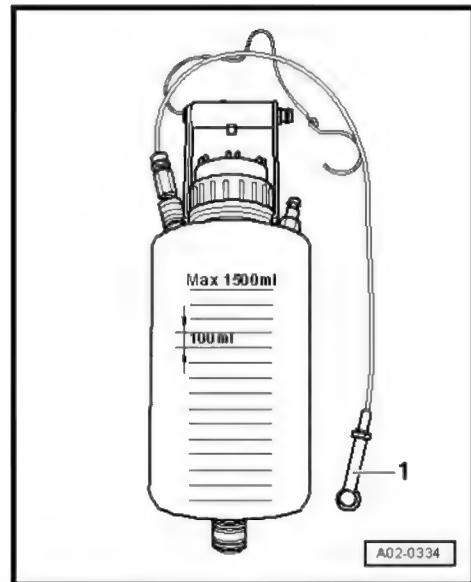
◆ Tool set for brake bleeding - VAS 6564-



◆ Brake pipe bleeding wrench - VAS 5519-



◆ Reservoir -1-

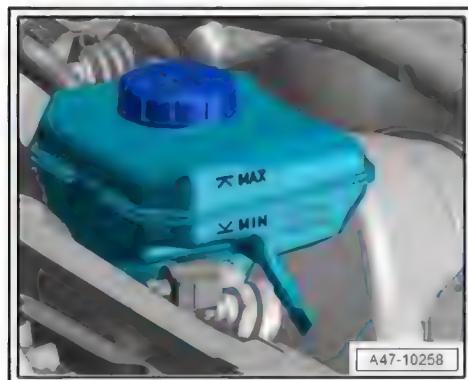


**Procedure**

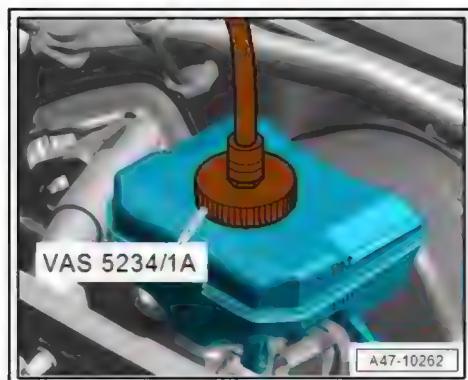
Observe instructions given in operating manual for -VAS 5234- or  
brake filling and bleeding equipment - VAS 6860- .

**Procedure**

- Fill brake fluid into brake fluid reservoir up to "max" marking.
- Fill brake fluid reservoir up to "MAX" mark.

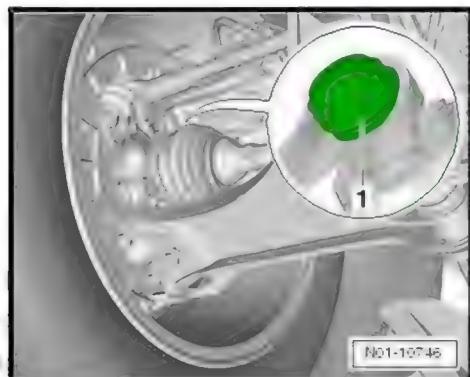


- Connect -VAS 5234- or brake filling and bleeding equipment - VAS 6860- with adapter -VAS 5234/1- .
- Set correct pressure on -VAS 5234- or -VAS 6860- ; observe  
⇒ operating instructions for -VAS 5234- / -VAS 6860- .



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- Detach dust caps (front) -1- on both sides.



- Detach dust caps (rear) -1- on both sides.



Note

*Use appropriate bleeder hose. It must sit tightly on the bleeder screw so that no air can enter the brake system.*

- Fit bleeder hose of reservoir onto bleeder screw.

Bleeding sequence

- 1 - Front left brake caliper
- 2 - Front right brake caliper
- 3 - Rear left brake caliper
- 4 - Rear right brake caliper



Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*
- With bleeder hose attached, leave bleeder screw open until the brake fluid which emerges is clear and free from bubbles.
- Press brake pedal 5 times to assist bleeding process.
- Tighten bleeder screw, detach bleeder hose and fit dust cap on bleeder screw.
- Repeat bleeding procedure in stated sequence at other brake calipers.
- Fill brake fluid reservoir up to "MAX" mark (depending on degree of pad wear) and screw on filler cap.



Note

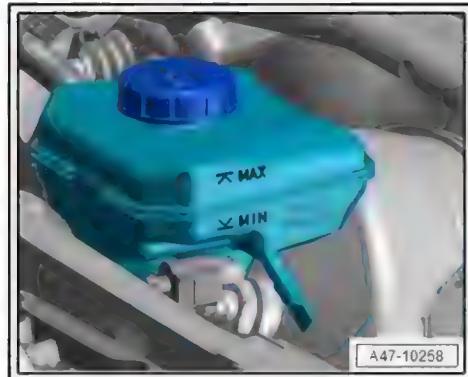
Procedure

- Fill brake fluid into brake fluid reservoir up to "max" marking.
- Close reservoir.
- Start engine and check brake pedal travel and brake pedal pressure.
- In the event of excessive pedal travel, check brake system for leaks and/or repeat bleeding procedure.



Note

*Perform road test after completion of bleeding. At least one ABS control operation must be applied at all four wheels.*



Brake fluid change

⇒ Maintenance ; Booklet 411



**WARNING**

*Risk of accident! Observe the information in the maintenance booklet.*

- ◆ *Make sure that the brakes work properly before the vehicle is driven on the road.*

## 6.2.2 Bleeding brake system without brake filling and bleeding equipment

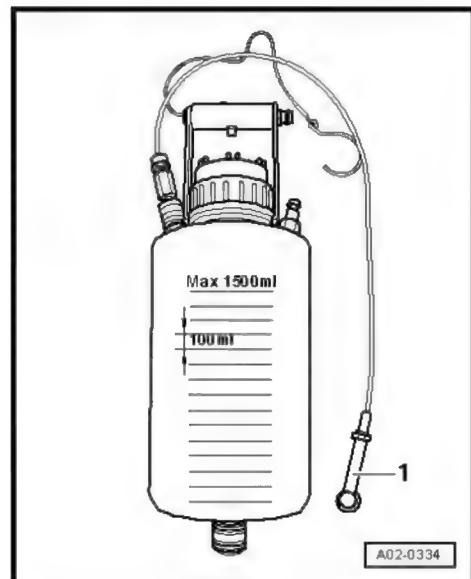


Note

- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*

Special tools and workshop equipment required

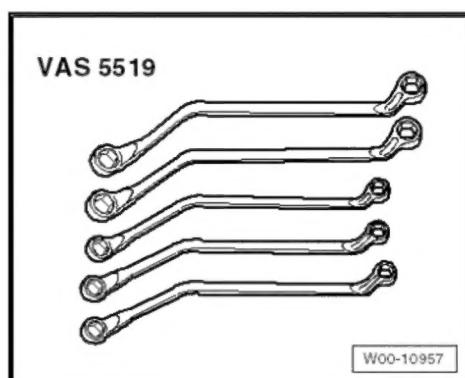
- ◆ Reservoir -1-



- ◆ Tool set for brake bleeding - VAS 6564-

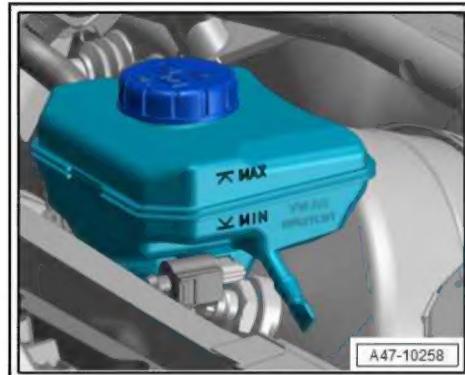


- ◆ Brake pipe bleeding wrench - VAS 5519-



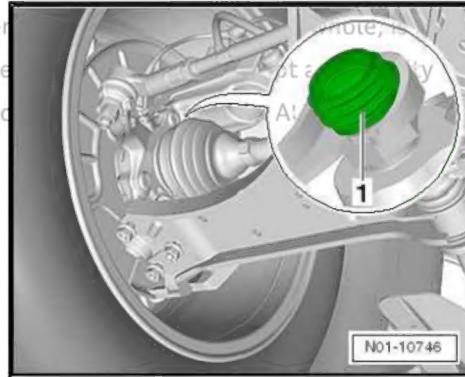
#### Procedure

- Fill brake fluid into brake fluid reservoir up to "max" marking.
- Close reservoir.



- Detach dust caps (front) -1- on both sides.

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- Detach dust caps (rear) -1- on both sides.

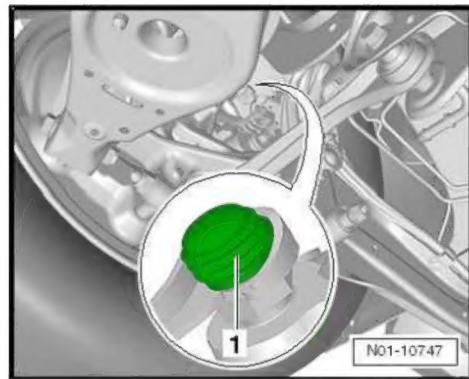


*Use appropriate bleeder hose. It must sit tightly on the bleeder screw so that no air can enter the brake system.*

- Fit bleeder hose of reservoir onto bleeder screw.

#### Bleeding sequence

- 1 - Front left brake caliper
- 2 - Front right brake caliper
- 3 - Rear left brake caliper
- 4 - Rear right brake caliper



- ◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*
- ◆ *Bleeder screw: 10 Nm*

- Build up pressure in brake system by pumping brake pedal.



*Press brake pedal slowly to avoid formation of bubbles.*

- Once pressure has built up, keep brake pedal depressed.
- With bleeder hose attached, leave bleeder screw open until the brake fluid which emerges is clear and free from bubbles.
- Keep pedal depressed and close bleeder screw.
- Release brake pedal and wait approx. 2 seconds to allow brake fluid to flow in from brake fluid reservoir.
- Repeat procedure until emerging brake fluid is clear and free from bubbles.
- Tighten bleeder screw, detach bleeder hose and fit protective cap on bleeder screw.
- Repeat bleeding procedure in stated sequence at other brake calipers.



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- Fill brake fluid into brake fluid reservoir up to "max" marking.
- Close reservoir.
- Start engine and check brake pedal travel and brake pedal pressure.
- In the event of excessive pedal travel, check brake system for leaks and/or repeat bleeding procedure.

#### Brake fluid change

⇒ Maintenance ; Booklet 411



#### WARNING

*Risk of accident!*

- ◆ Make sure that the brakes work properly before the vehicle is driven on the road.



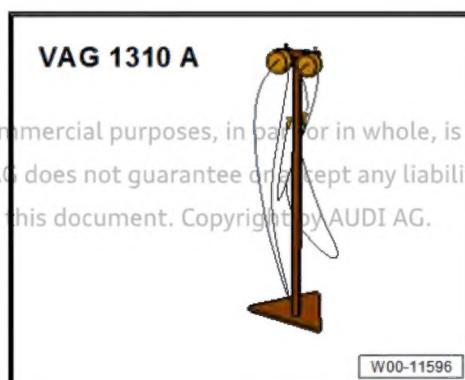
### 6.3 Leak test

Special tools and workshop equipment required

- ◆ Tester for brake pressure regulator - V.A.G 1310A-



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- ◆ Brake pedal actuator - V.A.G 1869/2-



#### High-pressure test:

- Make sure that the brake system (master cylinder, brake hoses, brake lines and brake calipers) works properly and is free of leaks.
- Unscrew bleeder screw at one of the front brake calipers. Connect tester for brake pressure regulator - V.A.G 1310A- and bleed.



Note

◆ *Bleed at each bleeder screw. If brake caliper has two bleeder screws, first bleed at inner screw.*

◆ *Bleeder screw: 10 Nm*

- Insert brake pedal actuator - V.A.G 1869/2- between brake pedal and driver seat. Apply pressure to brake pedal until the gauge indicates a pressure of 50 bar. The pressure must not drop by more than 4 bar during the test period of 45 seconds.

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Renew brake master cylinder if drop in pressure exceeds the  
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- Move the brake pedal actuator back until the pressure gauge indicates a pressure of 6 bar.
- The pressure should not drop by more than 1 bar within the test period of 3 minutes.

Renew brake master cylinder if drop in pressure exceeds the  
specification.

